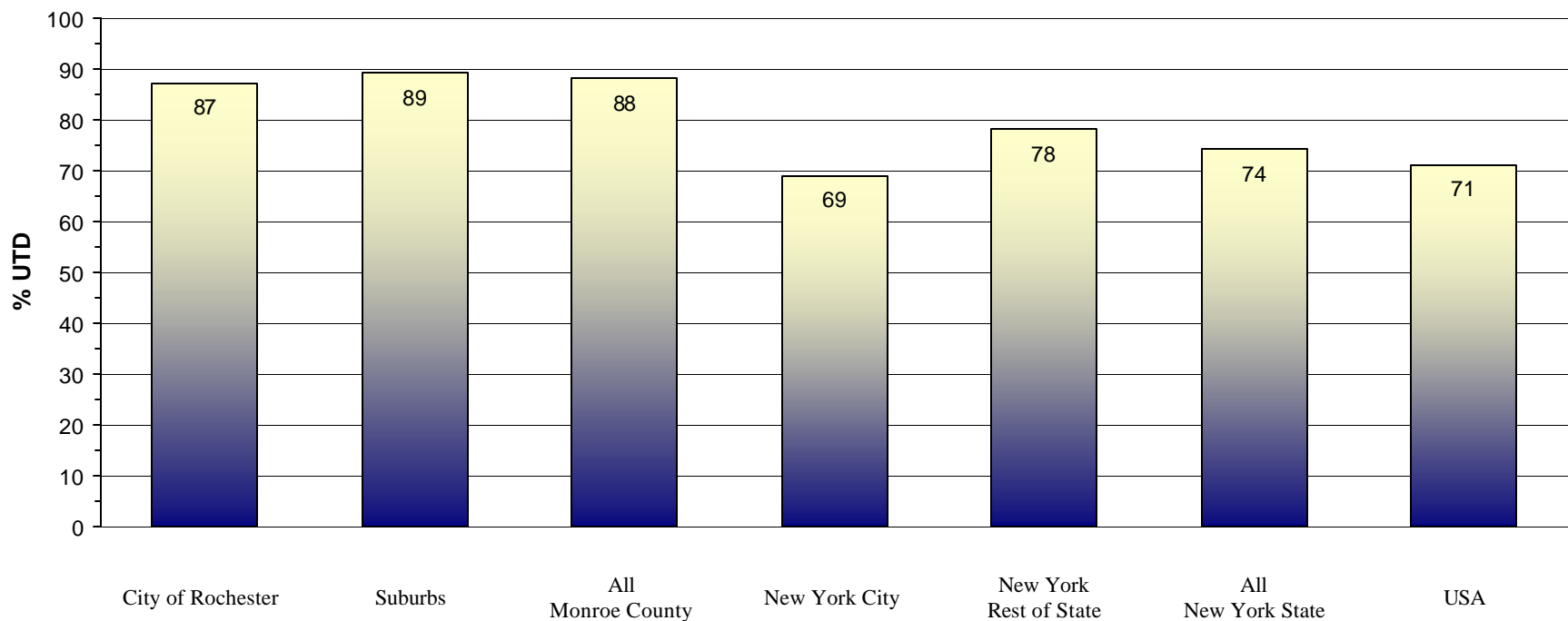


MONROE COUNTY IMMUNIZATION SURVEY - 1999

Monroe County Department of Health

How well is our county doing with respect to early childhood immunizations?

**Percent of Children Who Are Up-To-Date (UTD) At 24 Months of Age
DTP4/Polio3/MMR1/Hib3/Hep-B3 [4:3:1:3:3]**



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Executive Summary

Goals

The study goals were to determine 1999 childhood immunization rates (at 12 and 24 months) for Monroe County and for areas within the county, and to compare rates to 1993 and 1996 immunization rates.

Methods

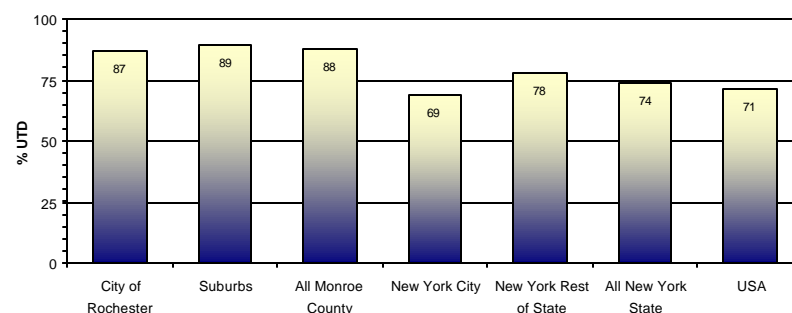
The study took advantage of the fact that nearly all children make at least one visit to a primary care provider within several years. We created a denominator list (85% of the county birth cohort) from the billing files from virtually all primary care pediatric and family medicine practices in Monroe County, sampled a random subset of children from each cohort (10% from suburban practices, [n=586] and 25% from city practices, n=1,147), reviewed medical charts at all practices visited by the patient, combined multiple records, and determined demographic characteristics and immunization rates by using data from billing files or chart reviews. For each patient, the most recent data were used. Results were weighted to reflect the sampling fractions.

Results

- Monroe County immunization rates increased substantially between 1993 and 1996, and again between 1996 and 1999.
- Up-to-date rates at 24 months are 83% in the inner city, 82% for the entire city of Rochester, 87% in the suburbs, and 85% for the county.
- Rates for individual vaccines are over 90% at both 12 and 24 months.
- The disparity in rates between the inner city and suburbs was reduced, so that rates in the suburbs are only 4% higher than in the inner city.

- Disparities in rates by race or ethnicity have virtually been eliminated.
- Uninsured and children on fee-for-service Medicaid have lowest rates.
- Immunization rates within areas of the city of Rochester are relatively similar, and rates within the different suburbs are also similar.
- 15 to 20% of county children are still underimmunized at 24 months.
- Immunization rates in Monroe County are much higher than across New York State or the U.S., (as shown for the 4:3:1:3:3 combination).

**Percent of Children Who Are Up-To-Date (UTD) At 24 Months of Age
DTP₄/Polio₃/MMR₁/Hib₃/Hep-B₃ [4:3:1:3:3]**



- High immunization rates have protected almost all children in Monroe County from vaccine-preventable diseases, and are a marker for high quality of primary care.

Up-to-Date Rates (UTD) – For 1993 vs. 1996 vs. 1999

		Children in the Inner City			Children in the Rest of the City			All Children Living in City of Rochester			Children Living in the Suburbs			All Children Living in the County			Children from Outside the County			All Children Seen in the County		
		93	96	99	93	96	99	93	96	99	93	96	99	93	96	99	93	96	99	93	96	99
At 12m	DTP ₃ /Polio ₂ /Hib ₃	67	84	87	79	89	89	72	86	88	88	95	92	80	90	91	85	94	90	81	90	90
	DTP ₃ /Polio ₂ /Hib ₃ /HepB ₂	-	78	87	-	81	88	-	79	87	-	86	91	-	82	90	-	85	89	-	82	90
At 24m	DTP ₄ /Polio ₃ /MMR ₁ /Hib _(≥12m)	55	75	84	64	81	81	58	77	83	73	85	89	66	81	87	66	84	88	66	81	87
	DTP ₄ /Polio ₃ /MMR ₁ /Hib _(≥12m) /HepB ₃	-	70	83	-	74	80	-	72	82	-	80	87	-	75	85	-	78	85	-	75	85

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Background

Importance of High Immunization Rates

Vaccines have been heralded as the most important public health achievement of the 20th century. The success of vaccination programs is highlighted by the tremendous reduction in vaccine preventable diseases. For example, from an annual morbidity of a half-million cases of measles during the 20th century, there were only 86 cases nationally in 1999. Cases of *Hemophilus influenzae type b* disease were reduced from an annual incidence of 20,000 to less than 200 nationally in 1999. The reduction in vaccine preventable diseases is directly related to the level of immunization rates—high rates reduce or eliminate vaccine preventable diseases. Conversely, low immunization rates can result in epidemics of disease, as demonstrated by the measles epidemic of 1989-1991 that was directly due to low immunization rates among toddlers, especially those in urban areas.

Immunization rates also correlate with other measures of preventive care. Children who are behind in immunizations are likely to be behind in other measures of preventive care. Similarly, populations that have low immunization rates have been shown to have poor rates of other preventive services. Thus immunizations are a marker of quality of care of a population, and even a county such as Monroe County.

National Immunization Program Goals

The federal government, states, and counties have made substantial efforts to improve childhood immunization rates. National targets now exist as part of the Healthy People 2000/2010 goals and the Childhood Immunization Initiative (CII). The CII goals are to:

- Reduce diseases preventable by childhood vaccination to 0;
- Increase vaccination levels for 2-year olds to at least 90% for the initial and most critical doses of the vaccine series; and
- Establish a sustainable system to ensure that at least 90% of all 2-year olds receive the full series of vaccines by the year 2000 and beyond.

Prior Immunization Surveys in Monroe County: 1993 and 1996

In 1993, Klaus J. Roghmann, PhD and a research team from the University of Rochester were contracted by the Monroe County Department of Health to perform a county-wide survey of immunization levels. This represented one of the first such county-wide surveys in the country. The 1993 survey found that overall immunization levels were very low (66% up-to-date at 24 months of age), and were significantly lower in the inner city (55% up-to-date), than in the suburbs (73% up-to-date).

Between 1993 and 1996 a number of changes occurred designed to improve the delivery of immunizations. Immunization guidelines changed, making it easier to deliver immunizations in a timely manner, the Standards for Pediatric Immunization Practices were widely disseminated, and improved Vaccine Information Statement forms used by most providers made it easier to explain the benefits and risks of immunizations. Combination vaccines such as Tetraimmune (DTP-HIB) became common. The Vaccine for Children program was launched in 1994, covering immunizations for children with Medicaid, no insurance, or inadequate insurance or Native American heritage; it also provides improved reimbursement for private providers. The First Dollar Insurance laws were passed in 1994, making well-child care visits and immunizations free to children covered by commercial insurance.

Between 1993 and 1996 in Monroe County there was increasing emphasis on improving immunization practices, in part due to studies by the Rochester Child Health Studies Group at the University of Rochester that revealed patient and provider barriers to immunization delivery. A large randomized clinical trial conducted by the Rochester Child Health Studies Group and funded by the Centers for Disease Control (CDC), utilized immunization outreach workers based in 6 primary care practices in the city of Rochester. This study found markedly improved immunization rates due to outreach (compared with controls). The Finger Lakes Regional Childhood Immunization Registry has incorporated this tracking and outreach effort as the “action arm” of the immunization registry.

In 1995, the Monroe County Department of Health, as part of the Immunization Registry effort, contracted with the Rochester Child Health Studies Group to repeat the Monroe County Immunization Survey. The 1996 Monroe County Immunization Survey found a substantial improvement in immunization rates: overall immunization rates rose from 55% to 75% in the inner city, from 64% to 81% in the rest of the city, from 73% to 85% in the suburbs, and from 66% to 81% for all children served in Monroe County practices.

Since 1996, further changes have occurred with respect to childhood immunizations. New vaccines were recommended and encouraged, including the Hepatitis B vaccination, which had been recommended for universal use just before the 1996 survey, and varicella vaccination. Guidelines for polio vaccination changed with oral polio no longer being recommended and IPV being universally recommended. All of these changes in guidelines involved more injections. In fact, between 1988 and 1998 the number of recommended injections for children before age 2 increased from 5 to between 11-15 injections. Studies showed some concern among both parents and providers about multiple injections. The arrival of the rotavirus vaccine and then the rapid withdrawal soon thereafter due to increased risk of intussusception, coupled with the concern about thimerosal in vaccinations, added fuel to a rising concern about the safety of vaccinations. An increasingly vocal anti-vaccination effort, promulgated using the internet in the late 1990s, increased some concern about parents' refusing vaccinations. This concern about safety was against a backdrop of disappearing vaccine preventable diseases, so that the diseases that vaccines were preventing were no longer visible but concerns about safety remained.

Another major change in childhood vaccinations involved a growing literature about what works to improve immunization rates, and a rising expectation about the performance of the health care system to be able to achieve high rates. Studies found that being able to identify children who are behind, and providing reminders, recall, and outreach, improved immunization rates. Our county attempted to institute this strategy on a population basis. Our Primary Care Outreach Program was expanded, with funds from the Monroe County DOH and the Daisy Marquis Jones Foundation, to cover about 70% of children who reside in the city of Rochester, where we had found that immunization rates had been lowest. The Finger Lakes Immunization Registry continued to expand within the city and neighboring counties, linked with the outreach program.

In addition to patient reminder/recall, a second major intervention that appears to work to improve immunization rates is measuring rates and providing feedback to providers. Assessment and feedback has become one of the key interventions promoted by the CDC. Our 1993 and 1996 surveys essentially raised assessment and feedback to the level of a county, since we assessed immunization rates for the entire county and different geographic regions within our county, and focused interventions where rates were lowest.

In 1998, the Monroe County Department of Health again contracted with the Rochester Child Health Studies Group to repeat the Monroe County Immunization survey. With additional funding from the CDC, the 1999 survey project was expanded to include (a) preventive care visits and screening rates, (b) health insurance, and (c) adolescent immunization rates. This report will focus on Monroe County's toddler immunization rates only. Reports outlining adolescent immunization rates, and preventive and screening visit rates will be forthcoming.

Objectives

There were four major objectives for this project:

1. Determine immunization rates for 12 and 24-month old children in Monroe County in 1999
2. Compare immunization rates for 1993, 1996, and 1999
3. Compare immunization rates versus national guidelines
4. Compare immunization rates among subgroups of the Monroe County population

This immunization survey utilized essentially the same methodology as the 1993 and 1996 surveys, in order to have comparable results.

Methods

Target Population

As in earlier immunization surveys (1993 and 1996), the target population was 2-year old children, who receive primary medical care in Monroe County. For this survey, children born between 6/1/96 and 5/31/97 were selected. Approximately 88% of these children reside in Monroe County, while 12% reside outside of the county, but are served by practices located within the county.

Study Design

As in the earlier surveys, this is a cross-sectional survey of immunization rates, for 2-year old children, who receive primary medical care in Monroe County.

Listings of children born between 6/1/96 and 5/31/97 were obtained from Pediatric and Family Medicine practices across Monroe County. For practices located in the city, approximately 25% of the patients were randomly sampled within each practice. For practices located in the suburbs, approximately 10% of the patients were randomly sampled within each practice. Visit and immunization history from the first two years of the children's lives was collected from their medical charts. Data were analyzed using the STATA statistical analysis software. Outcomes were weighted to reflect the sampling fractions.

Although this method is different from some other immunization surveys in the U.S., we chose it for several reasons. First, this method was used in both the 1993 and 1996 surveys, and therefore allows for direct comparison to rates in those years. Second, prior studies we conducted found that virtually all children in Monroe County have a primary care provider, and have made at least one visit to that provider. Thus, we can be assured that we miss very few of the county's children in our sample. Finally, while some other designs are promising, they also have major methodological problems. For instance, following a cohort from birth certificates is difficult because addresses change frequently; and while telephone surveys are tempting, they miss people without phones, and few parents can give accurate immunization information.

Steps in Fieldwork

1. Create A Database of Primary Care Practices and Providers

Using our current list of pediatricians and family practitioners as a starting point, we conducted an extensive review of the Rochester Telephone Directory, Children's Hospital's list of physicians with admitting privileges, and local insurers' lists of providers, to build a comprehensive list of local primary care practices (see Appendix 1).

2. Recruit Practices

We initially sent each practice an information packet about the project, including a return postcard to indicate whether they wanted to participate (see Appendix 2). If a practice refused or failed to respond, the principal investigator for the project contacted practice providers, in person or by phone, to urge their support. In many cases, this personal approach persuaded the practice to participate. As practices agreed to participate, the project coordinator contacted the practices by phone to arrange for patient lists and appropriate times for chart reviews to be conducted.

3. Identify the Denominator

Most of the participating practices (91%) were able to provide us with a computer-generated list of their patients in the birth cohort – either electronically or printed. For practices that had no computerized list, our technical associate reviewed every medical chart to identify patients in the birth cohort. As the lists came into our office, electronic listings were converted and stored in a database. Printed and manual lists were manually entered into the database. Data items included patient name, date of birth, and gender; and when available, address, race/ethnicity, and insurance.

Table 1 Type of Patient List Provided by Participating Practices				
	Electronic	Printed	Manual	Total
Practices	34 (54%)	23 (37%)	6 (10%)	63
Estimated Cohort	6,347 (56%)	2,852 (25%)	481 (4%)	9,680

4. Adopt Strategies to Move the Process Along

In a perfect situation, we would have received each practice's list of patients at the same time, combined the lists, eliminated the duplicates, and drawn a sample for chart review. However, it is not currently possible to obtain all practices lists of patients at the same time. In order to move the process along, we decided to eliminate duplicate patient records within practices as the practice lists arrived, select a preliminary sample, and start the chart review. Later, when we were confident that we had received all of the patient lists from participating practices, we would eliminate duplicate records across practices, and if necessary sample additional patients.

5. Merge and Eliminate "Bad Records" within Practices

Occasionally, patients are assigned multiple medical record numbers or given multiple charts at a practice. We identified possible duplicate records (PDR), using matching techniques based on the patient's name, date of birth, and gender. If a manual review of these PDR's revealed a duplicate, the duplicate records were merged. About 1% of all records received were duplicates within the practices.

Additionally, some area hospitals "pre-load" their affiliated practice's billing systems with information for patients born in the hospital. These patients do not always end up going to the affiliated practice, however, these records do persist in the billing systems. We could generally identify these records by the use of temporary patient names such as "Baby Boy/Girl". About 2.4 % of all records received were these "baby" records.

Altogether, 405 of these records were dropped from the denominator.

6. Select a Preliminary Sample of Potential Cases

The sampling strategy was identical to that used in the 1993 and 1996 surveys. As practice lists were received, each patient record in the practice denominator was assigned a random number. The records were then sorted by the random number, and the first 10% (for suburban practices) or 25% (for city practices), were selected for the preliminary sample of "potential cases".

7. Preliminary Chart Review

The two technical associates were trained to perform chart reviews. A chart abstraction form was developed (see Appendix 2), that facilitated collection of immunization histories as well as preventive care screenings and insurance information. Preliminary chart reviews began in March of 1999, and were performed at a time convenient for each practice. Data collected was entered into an Access database.

8. Identify Patients Who Are Seen at Multiple Practices

After several attempts had been made to convince practices to participate in the project, and after all patient lists had been received from the participating practices, we needed to identify patients who were going to multiple practices. We used the same record matching techniques as we used for identifying duplicates within practices, except now we were working with the "whole" denominator. Approximately 8% of all records received were duplicates across practices. For these children, one of the multiple practices visited was randomly selected to be the "medical home." Other practices visited were considered to be secondary sites of care.

9. Second Chart Review for Patients Seen at Multiple Practices and for Missing Demographic Information (Race/Insurance)

For children from the preliminary sample who had been seen at multiple sites, an additional chart review was prepared for each additional site. Also, a cursory list of children missing insurance or race/ethnicity data was prepared for additional review. These second round chart reviews and data confirmations began in March of 2000.

Table 2
Sampling and Number of Charts Reviewed

Patient Listing Records Received	11,847	
Less "Baby Boy/Girl" & Duplicates Within Practices	405	(3.4%)
Unique Records Within Practices	11,442	
Less Duplicates Across Practices	915	(8.0%)
Unique Records Across Practices	10,527	

10. Drop Patients Found Ineligible During Chart Review

Not every patient listing record selected for chart review corresponded to an actual patient in the practices. Table 3 details the post-chart review reasons for dropping cases. In total, 273 of the sampled billing records (or 15.8%), were not eligible for the survey for the reasons listed in the table.

11. Chart Review Quality Assurance

Three measures were taken to assure the quality of chart reviews over the course of the project.

- First, the project coordinator made regular site visits to spot check the technical associates' chart reviews in progress.
- Second, approximately 1% of the preliminary chart reviews were conducted two times, by separate individuals, and the results were compared. There was a high level of agreement in data items collected from the progress notes between the 1st and 2nd reviews. For instance, the visit type was in agreement in 98.0% of visit records collected, and the immunization data were in agreement in 99.6% of the visit records.
- Finally, all sampled patients who did not appear to have complete immunization records (i.e. had less than 4 DTP, 3 Polio, 1 MMR, 4 Hib, and 3 Hep-B vaccines by 24 months of age), were re-reviewed to confirm the shot data. Practice staff, outreach workers and the project staff rechecked approximately 30% of the sample for shot data. Immunization outreach workers' records proved particularly valuable in locating missing shot data.

12. Geocode the Addresses to Census Tracts and Regions

Addresses were carefully reviewed and corrected for spelling and abbreviations. Street Wizard software was then used to recode the addresses into points of latitude and longitude; and MapInfo software was then used to recode the points into census tracts. Finally, the census tracts were coded into areas, geographic regions, and quadrants based on specifications used in the 1993 and 1996 surveys (see Table 16 in Appendix 3).

Table 3
Patients Excluded During Chart Review

	Urban Practices	Suburban Practices	All Practices
Patients Sampled for Chart Review	1,147	586	1,733
Chart indicated primary care at another non-participating site	17	0	17
Chart indicated primary care at another participating site, but no record at that site	0	2	2
Had less than 2 visits	20	20	40
Had wrong DOB	7	5	12
Moved here or was adopted from a foreign country	7	3	10
Moved/Lives out of the area	40	8	48
Multiple sites, but not seen, not a patient, or has no chart at any of them	6	3	9
Only site, but After Hours, Cross Coverage, or 1 Time Visit only	24	7	31
Only site, but no chart found here	22	8	30
Only site, but not a patient here, never seen, or is a new patient who hasn't been seen yet	15	11	26
Only site, but only seen for non-primary care here	3	0	3
Only site, but transferred, inactive or moved – Chart is in storage	8	8	16
Only site, but transferred, inactive or moved – Chart is still on site	22	5	27
Patient died	1	1	2
Total Exclusions	192	81	273
Records Chart Reviewed	955	505	1,460

Measures

The chart review form used for this project is a common form used for several projects conducted in our office. Not all data items on the form were collected for this project. Table 4 shows the measures collected for this project, the primary source of the data, and the purpose of collecting the item. All measures were verified when possible through chart review.

The most recent insurance noted on the chart was abstracted. Street address was obtained solely for the purpose of determining the census tract. If the medical chart indicated that the patient transferred out of the practice (moved), it was noted along with the date of the note. The type of primary care practice was obtained from our master list.

Dates for visits at which shots were given were recorded from the chart reviews for all immunizations; this involved review of the front sheets as well as the body of the chart including visit notes. If only a month was noted in the chart (e.g., 6/97), and a visit note was not present, the date was assumed to be the fifteenth of the month. For initial Hepatitis B vaccine, the date of birth was used if only an annotation with no date appeared in the chart.

Up-to-date measures were according to current recommendations, and were calculated based on counting the actual number of shots received by the corresponding age. Up-to-date status was obtained for each individual immunization, as well as for combinations as shown in Table 5. The percent of children up-to-date at 12 and at 24 months was determined.

Census tracts were geocoded from the sampled patient's street address. Geographic regions (Inner City, Rest of City, Quadrants of the City, and Quadrants of the County), were generated from the census tract using the coding scheme from the 1993 and 1996 surveys (see Table 16 in Appendix 3).

Table 4
Measures Collected

Source	Data Item	Purpose
Our Master List, Phone Book Insurance Company Lists etc.	Practice Name	Project Management
	Practice Model	Analysis Outcomes
	Practice Address	Recoded to Census Tract / Geographic Regions
	Practice Phone Number	Project Management
	Practice Contact	Project Management
Billing System Extract or Practice Patient Lists	Medical Record Number	Chart Review Management
	Date of Last Visit	Analysis Outcomes
	Household Identifier	Chart Review Management – Some Practices file by family
	Patient Name	Chart Review Management And Matching Across Sites
	Patient Date of Birth	Chart Review Management, Analysis Outcomes And Matching Across Sites
	Patient Gender	Chart Review Management, Analysis Outcomes And Matching Across Sites
	Patient Race/Ethnicity	Analysis Outcomes
	Patient Address	Recoded to Census Tract and Geographic Regions
Chart Review	Patient Insurance Plan	Analysis Outcomes
	Visit Date	Analysis Outcomes
	Visit Type / Purpose	Analysis Outcomes
	Types of Shots Given DTaP, Polio, MMR, Hib, HB, etc.	Analysis Outcomes

Table 5
Up-to-Date Measures

12 Months	24 Months
DTP ₃	DTP ₄
Polio ₂	Polio ₃
HIB ₃	HIB ₄
HepB ₂	HepB ₃
DTP ₃ /Polio ₂ /HIB ₃	MMR ₁
DTP ₃ /Polio ₂ /HIB ₃ /HepB ₂	DTP ₄ /Polio ₃ /MMR ₁
	DTP ₄ /Polio ₃ /MMR ₁ /HIB ₃ /HepB ₃
	DTP ₄ /Polio ₃ /MMR ₁ /HIB ₄
	DTP ₄ /Polio ₃ /MMR ₁ /HIB ₄ /HepB ₃
	DTP ₄ /Polio ₃ /MMR ₁ /HIB _(=12m)
	DTP ₄ /Polio ₃ /MMR ₁ /HIB _(=12m) /HepB ₃

Analysis

1. Probability Weighting

Our survey sampled 25% of the children (to the nearest whole child), from practices located within the city; and sampled 10% of the children (to the nearest whole child), from practices located in the suburbs. In the analysis, we weighted each child using the inverse of the actual probability of being selected from the child's practice.

For example, if there was a very small suburban practice that had 7 children, we would have sampled 1 child from this practice (7×0.10 rounded to the nearest whole child). The probability weight for this child would be 7 (or $7/1$ – not $10/1$, because we used the inverse of the actual probability of being selected).

2. Factoring In Children from Non-Participating Practices

We were not able to sample children from 26% of the practices. We estimate (based on our experience with these practices, their billing data, the number/type of providers, and practice location), that these practices see 15% of the 2-year old population of Monroe County.

In order to factor in these children, we matched each non-participating practice to a similar participating “proxy” practice (based on geographic proximity to each other, practice model (when possible), and number of providers – when possible). Each matched participating practice was assigned a multiplicative factor to represent the population of the non-sampled practices (based on the actual ratio of children at the non-participating practice to children at the participating practice – when the number of children was known; or based on the ratio of the number of providers, when the number of children was not known). In the analysis, each child from a proxy practice was additionally weighted by the multiplicative factor to represent a corresponding child from the non-participating practice.

3. Accounting for the Sample Design

Our survey uses a stratified, clustered sampling design. The primary sampling unit (PSU) is the practice; the sampling within practices is stratified by their location (city or suburbs). Most statistical analysis software (such as SAS or SPSS), as well as WINCASA (created by the

Centers for Disease Control), do not allow for accurate determinations of rates and confidence intervals using such a sampling design.

We decided to use STATA software (specifically the `svytab` command) to insure that we accounted for our sampling scheme and reported the correct point estimates and confidence intervals. Statistical adjustments were made using STATA to account for three design features: 1) The probability weights, 2) clustering (include a practice term as the PSU), and 3) stratification (included the city/suburb practice location as the strata).

4. Focus of Analysis

The analysis for the survey is primarily descriptive, reporting counts and rates (percent). Generally, the unit of analysis is the individual child, although some results are also reported based on practice characteristics (for instance, participation is reported by type of practice).

Our analysis focused on the following six areas:

1. Practice Participation
2. Population Estimates
3. Demographic Descriptions by Geographic Regions
4. Analysis of Trends in Up-To-Date Rates
5. Current Up-To-Date Rates by Demographics
6. Current Up-To-Date Rates by Geographic Regions

5. Geographic Regions

Analysis by quadrant is in accordance with long-standing geographic divisions used by the county health department. The city of Rochester was divided into Inner City (consisting of Census tracts in which $\geq 50\%$ of the births were on Medicaid), and Rest of the City. The county is divided into City vs Suburbs based on the municipal boundaries of the city of Rochester.

6. Arrangement of Results

Practice participation, population estimates, and demographic descriptives / immunization rates (by City/Suburb/County/Outside of County/All Served), are reported using charts and tables in the body of the report. Demographics and rates by other geographic regions are contained in the appendices.

Results

Participation of Primary Care Practices

Table 6 shows the practice participation rate both by practice location and by type of practice, as well the reasons for not participating. Altogether, 63 out of 85 practices participated, and 85% of the birth cohort of 11,392 (which includes all children being served by Monroe County practices), was included in those practices that participated.

Pediatric practices were more likely to participate than Family Medicine practices (36/47 vs. 16/27); however, the number of children enrolled in the Family Medicine practices was much smaller than the number enrolled in the Pediatric practices.

There were several reasons why 22 practices did not participate in the project. The largest group (15/22) was non-responders. These were practices that despite several follow-up letters and phone calls, and even calls from the principal investigator, never responded. Three practices refused due to concern for patient confidentiality. Two practices refused because they were in the process of moving office locations. Lastly, two sites did consent but were not able to participate due to their inability to provide a patient list.

Summary:

- *We were able to sample from 85% of the 2-year old population*

Table 6
Practice Participation Rate and Reasons for Not Participating

By Practice Location				
	Eligible		Participating	
	Practices	Estimated Cohort	Practices	Estimated Cohort
City	23	4,575	18 (78%)	4,246 (93%)
Suburbs	62	6,817	45 (73%)	5,434 (80%)
All	85	11,392	63 (74%)	9,680 (85%)
By Type of Primary Care Practice				
	Eligible		Participating	
	Practices	Estimated Cohort	Practices	Estimated Cohort
Pediatrics	47	7,169	36 (77%)	5,828 (81%)
Family Medicine	27	1,274	16 (59%)	903 (71%)
Neighborhood Health Center	3	531	3 (100%)	531 (100%)
Hospital Clinic	4	2,008	4 (100%)	2,008 (100%)
Staff HMO	4	410	4 (100%)	410 (100%)
All	85	11,392	63 (74%)	9,680 (85%)
Reasons for Not Participating				
Non-Responders (i.e. Did not respond to multiple letters or repeated phone calls)				15
Concern for Patient Confidentiality				3
Staffing Issues (e.g. recent office move)				2
Unable to Provide a Patient List; Impractical/Impossible to Produce a Manual List				2
Total Non-Participants				22

Population Estimates and Trends

Since there is no perfect method to obtain a sample of the Monroe County population, an important question involves the degree to which this practice-based immunization survey accounts for the county's entire two-year-old population.

The 1990 Modified Population Count of 2 year olds for Monroe County was 10,899¹ children. Also, as shown in Table 7, our current population estimate is comparable to the estimates from the 1993 and 1996 surveys. Although it is not possible to precisely calculate the true population size due to our inability to capture all practices in the survey, we believe that our weighted number is a good estimate of the total population of 2-year old children residing in Monroe County – about 10,000.

Additionally, there has been a shift over time in the distribution of 2-year old children across Monroe County. The proportion of children residing in the suburbs (62%) is growing, while the proportion in the inner city (22%) and rest of the city (15%) have been shrinking.

Summary:

- *The current 2-year old population is approximately 10,000 children*
- *Currently greater than 60% of the 2-year old population reside in the suburbs*

Figure 1

**Trends in Toddler Population Distribution
1993 versus 1996 versus 1999**

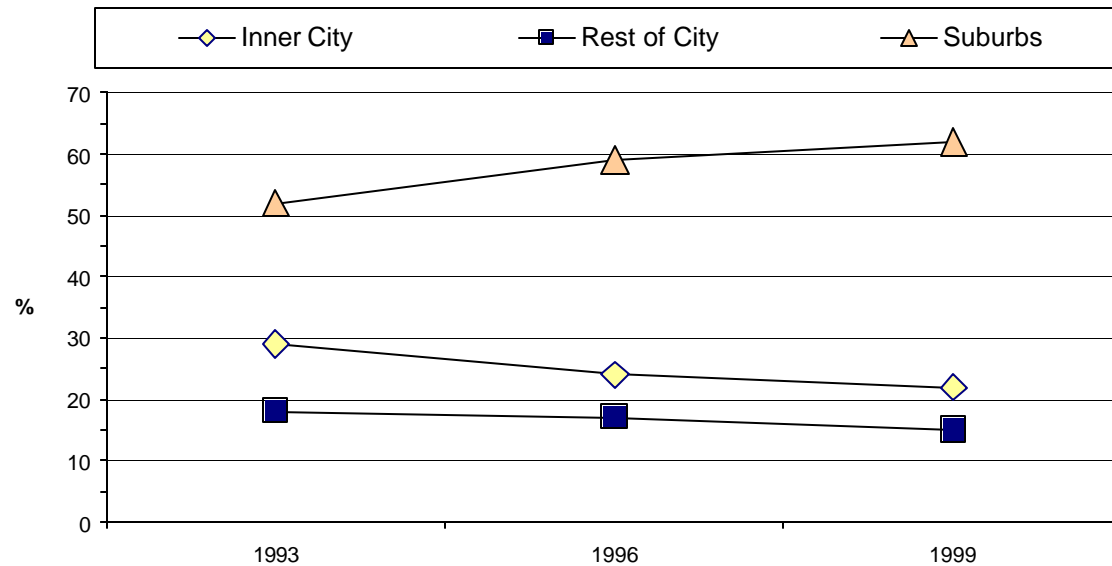


Table 7

**Estimated 2 Year-Old Child Population
By Region For 1993 versus 1996 versus 1999^{1,2,3}**

	1993		1996		1999	
	Number of Children	Percent of County Residents	Number of Children	Percent of County Residents	Number of Children	Percent of County Residents
Inner City	2,788	29 %	2,540	24 %	2,247	22 %
Rest of the City	1,724	18 %	1,776	17 %	1,548	15 %
Suburbs	4,984	52 %	6,292	59 %	6,271	62 %
Monroe County	9,496	100 %	10,608	100 %	10,066	100 %
Outside the County	1,048	11 %	1,376	13 %	1,326	13 %
All Children Seen	10,544	111 %	11,984	113 %	11,392	113 %

¹ The 1990 Modified Population Count for the County was 10,899 for 2 year olds (NYS Bureau of Biometrics).

² 1993 and 1996 estimates are from the Monroe County Immunization Surveys for those years.

³ 1999 estimates are based on the number of unique children listed by practices, weighted for sampling fractions.

Demographic Characteristics

Table 8 and the Figures 2-7 summarize some of the demographic characteristics of the population of 2-year olds in Monroe County (children born between 6/1/96 – 5/31/97), including gender, race and ethnicity, number with a primary care visit in the prior 12 or 24 months, type of primary care practice, and insurance status. Results are shown for children in the city of Rochester, suburbs, all children residing in Monroe County (excluding out-of-county children), children from outside of the county who receive care in Monroe County, and all children served in Monroe County practices. Appendix 4 shows detailed demographic information for specific quadrants and areas within the city of Rochester and suburbs.

A detailed summary of these demographic characteristics is shown on the next several pages.

Summary:

- *Monroe County is quite diverse in terms of ethnic and racial groups*
- *Children from racial and ethnic minority groups are concentrated in the city of Rochester*
- *A variety of health care providers serve children in Monroe County*
- *Nearly all children have a source of primary care, have seen their doctor in the past year, and have health insurance*

Table 8 Demographic Characteristics of Patients By Geographic Region											
		Children in the City of Rochester N @ 3,795		Children Living in the Suburbs N @ 6,271		All Children Living in the County N @ 10,066		Children from Outside the County N @ 1,326		All Children Seen in the County N @ 11,392	
		N	%	N	%	N	%	N	%	N	%
Gender	Female	1,879	49.5	2,909	46.4	4,788	47.6	704	53.1	5,492	48.2
	Male	1,916	50.5	3,361	53.6	5,277	52.4	622	46.9	5,900	51.8
Race / Ethnicity	Asian/Pacific Islander	66	1.7	202	3.2	253	2.5	7	0.5	266	2.3
	Black – Non-Hispanic	1,905	50.2	442	7.1	2,779	27.6	25	1.9	2,851	25.0
	Hispanic	710	18.7	177	2.8	1,044	10.4	25	1.9	1,086	9.5
	Other	220	5.8	162	2.6	414	4.1	38	2.9	454	4.0
	White – Non-Hispanic	895	23.6	5,286	84.3	5,575	55.4	1,230	92.8	6,734	59.1
Time of Last Visit	Within Past Yr	3,689	97.2	6,126	97.7	9,815	97.5	1,322	99.7	11,136	97.8
	More Than 1 Yr Ago	79	2.1	135	2.2	215	2.1	4	0.3	219	1.9
	No Record of Visits	27	0.7	9	0.1	36	0.4	0	0.0	36	0.3
Type of Primary Health Care Provider	Family Medicine	340	9.0	559	8.9	898	8.9	269	20.3	1,167	10.2
	Hospital Clinic	1,590	41.9	385	6.1	1,976	19.6	79	6.0	2,054	18.0
	Neighborhood Health Center	540	14.2	46	0.7	586	5.8	5	0.4	592	5.2
	Pediatric Practice	1,131	29.8	5,005	79.8	6,136	61.0	965	72.7	7,100	62.3
	Staff Model HMO	194	5.1	276	4.4	470	4.7	9	0.7	478	4.2
Number of Sites of Care	One	2,978	78.5	5,612	89.5	8,590	85.3	1,107	83.5	9,697	85.1
	Multiple	817	21.5	659	10.5	1,476	14.7	219	16.5	1,694	14.9
Insurance	MC – Private (Fully Insured)¹	1,257	33.1	5,033	80.3	6,319	62.8	1,072	80.8	7,395	64.9
	FFS – Private (Underinsured)²	77	2.0	376	6.0	455	4.5	112	8.4	568	5.0
	MC – Medicaid¹	1,033	27.2	231	3.7	1,250	12.4	28	2.1	1,274	11.2
	FFS – Medicaid²	990	26.1	229	3.7	1,206	12.0	46	3.5	1,249	11.0
	Child Health Plus	123	3.2	198	3.2	321	3.2	24	1.8	346	3.0
	Uninsured	306	8.1	188	3.0	492	4.9	44	3.3	535	4.7
	Other	9	0.2	14	0.2	23	0.2	0	0.0	23	0.2

¹ MC = Managed Care

² FFS = Fee For Service

Race and Ethnicity:

In the city of Rochester, 50% of children are black, 19% Hispanic, and 24% white. In all of Monroe County, 28% of children are black, 10% Hispanic, and 55% white. These racial and ethnic distributions are similar to distributions noted on the 1990 US Census and on the 1996 Immunization Survey.

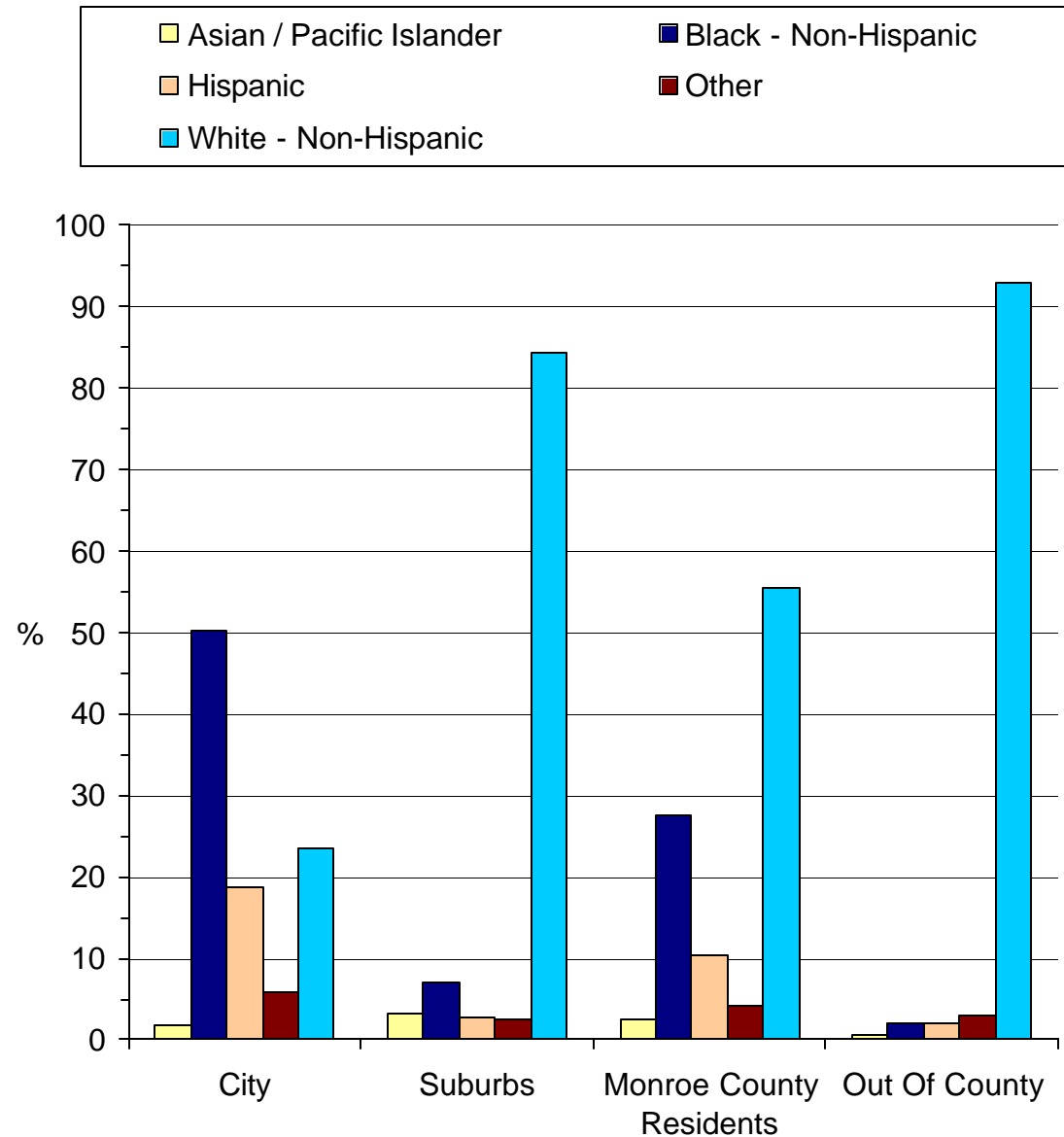
It is important to note that race and ethnicity were available for approximately 71% of all sampled patients for this immunization survey. Race/Ethnicity data were generally less available for children seen in suburban practices (about 46% of children had data), than for those seen in urban practices (about 85% of children had data).

For the population, based on the children's residence, we had data for approximately 65% of the children (weighted). Again, data were least available for children residing in the suburbs or outside of the county (55% – 56%), compared to children living within the city (83%).

Summary:

- *More than two-thirds of children living in the city of Rochester are black or Hispanic*
- *More than one-third of children living in Monroe County are black or Hispanic*
- *Eighty-five percent of children living in the suburbs of Monroe County are white*

Figure 2
Race and Ethnicity by Geographic Region



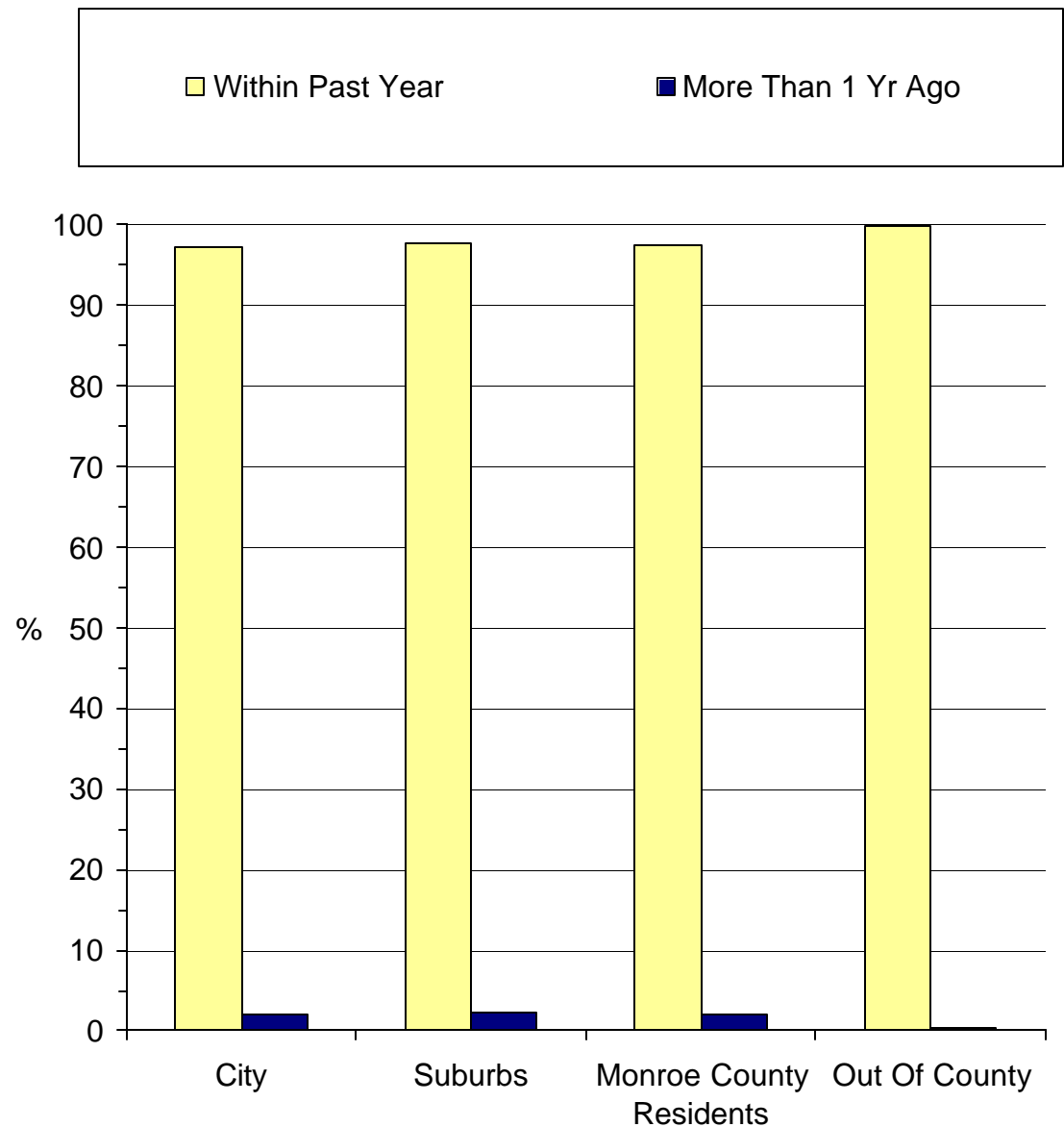
Time of Last Primary Care Visit:

The American Academy of Pediatrics (AAP) recommends well-child care visits at specific intervals (2 weeks, 2, 4, 6, 9, 12, 15, 18, and 24 months). Thus all these 2-year olds should have had several visits in the prior 12 months, and certainly all should have had at least one visit to a primary care provider. As Table 8 and Figure 3 show, 98% of all 2-year olds in Monroe County, including 97% of children in the city of Rochester, had at least one primary care visit within the past 12 months. Only 0.4% of children in Monroe County, and 0.7% of 24-month old children living in the city of Rochester had no record of visits between 0-24 months of age. These findings suggest very high access to primary care in this county. Of note, these data include well-child care, acute, or follow-up visits.

Summary:

- *Nearly 100% of 2-year old children, including those living in the city, had at least one primary care visit in the prior 12 months*
- *Access to primary care in Monroe County is high*

Figure 3
Time of Last Primary Care Visit by Geographic Region



Type of Primary Care Provider:

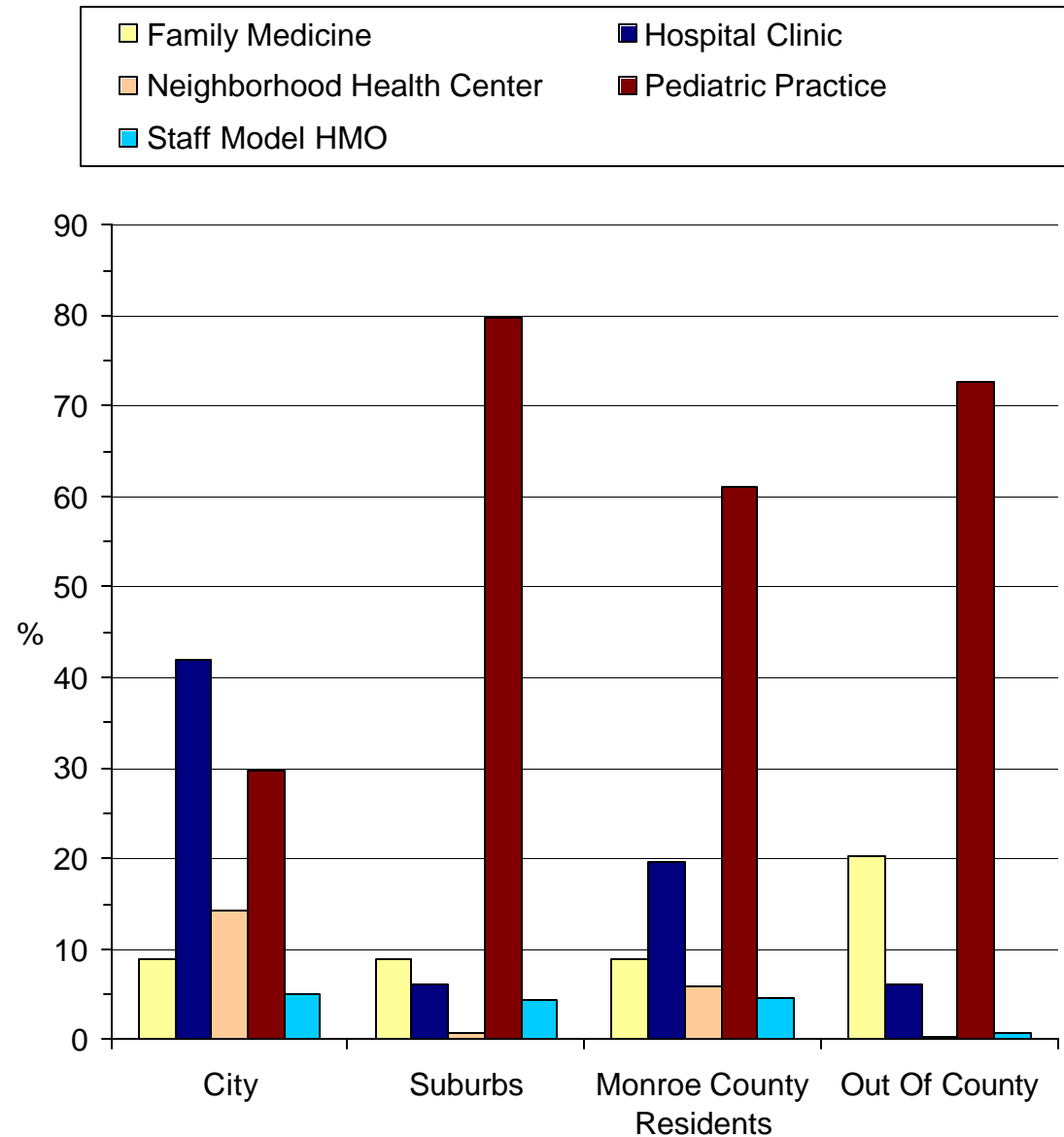
Table 8 and Figure 4 display the type of primary health care providers for Monroe County's young children. Throughout the county, private pediatric practices serve 61% of 2-year old children, family medicine practices serve 9%, hospital-based clinics or practices serve 20%, neighborhood health centers serve 6%, and staff-model HMOs serve 5% of children. For children residing in the city of Rochester, hospital-based clinics serve 42%, pediatric practices 30%, neighborhood health center 14%, and family medicine practices 9%. In the suburbs, pediatric practices (80%) and family medicine practices (9%) serve the vast majority of children.

Since 1996, a greater proportion of children who reside in the city of Rochester are being served by hospital clinics. The proportion of city children seen at hospital-based clinics increased from 33% in 1996 to 42% in 1999, with a 5-6% decline in the proportion seen at neighborhood health centers (19% to 14%) and family medicine practices (15% to 9%).

Summary:

- *Most suburban children are served by private pediatric practices, and the majority of city children by hospital clinics and health centers*
- *Since 1996, many more children living in the city are now served by hospital clinics*

Figure 4
Type of Primary Care Provider by Geographic Region



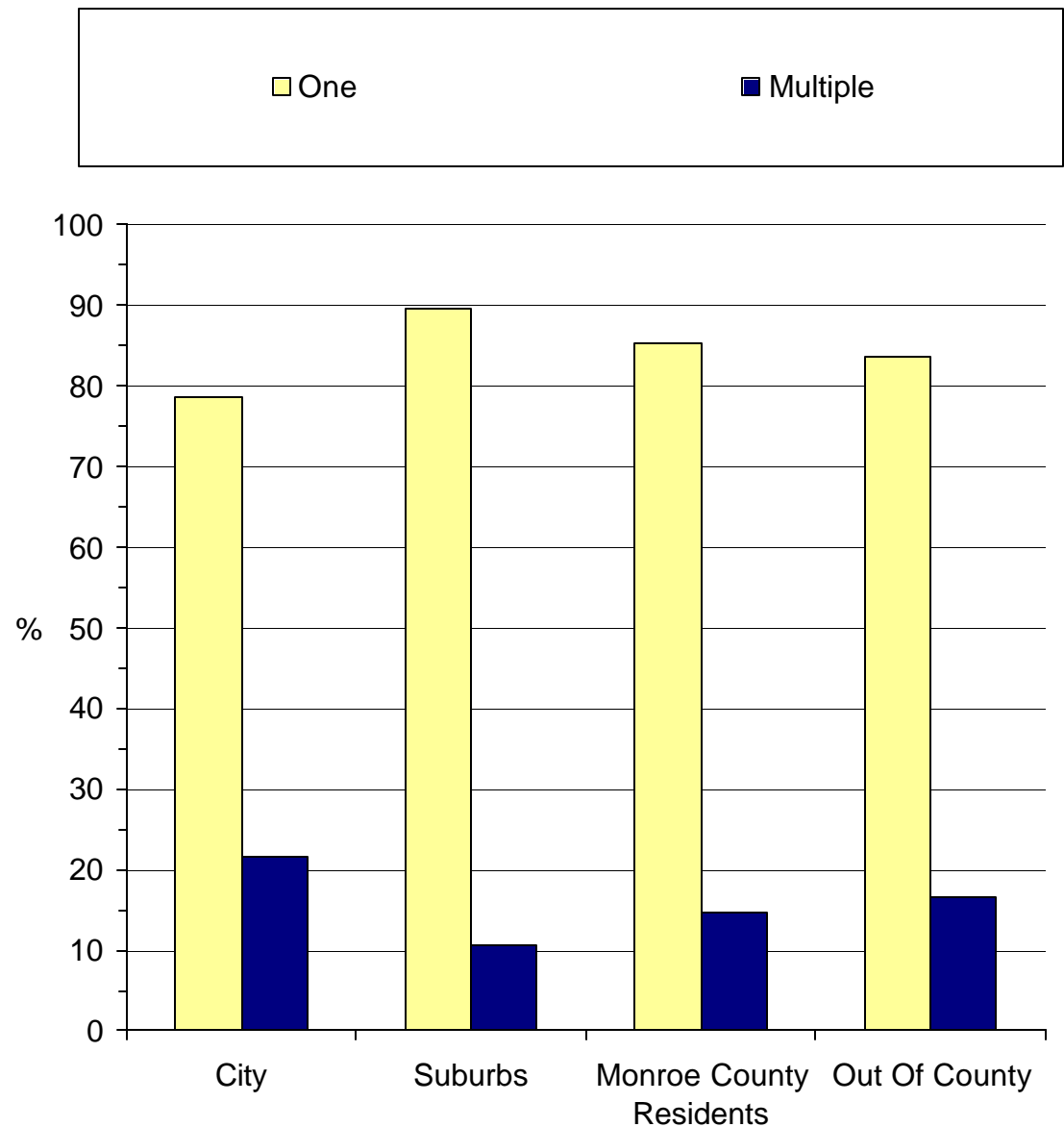
Number of Sites Of Care:

Table 8 and Figure 5 both display the proportion of 2-year old children who were seen at one primary care provider's office during their lifetime, and the proportion seen at two or more practices. More than 78% of children in the city of Rochester, and more than 89% of children in the suburbs had been seen at only one primary care provider. Conversely, around 22% of children living in the city and 11% of children living in the suburbs were seen at two or more practices.

Summary:

- *Most two-year olds in Monroe County have had only one primary care provider*
- *Continuity of primary care is very high in Monroe County*

Figure 5
Number of Sites of Care by Geographic Region



Type of Health Insurance:

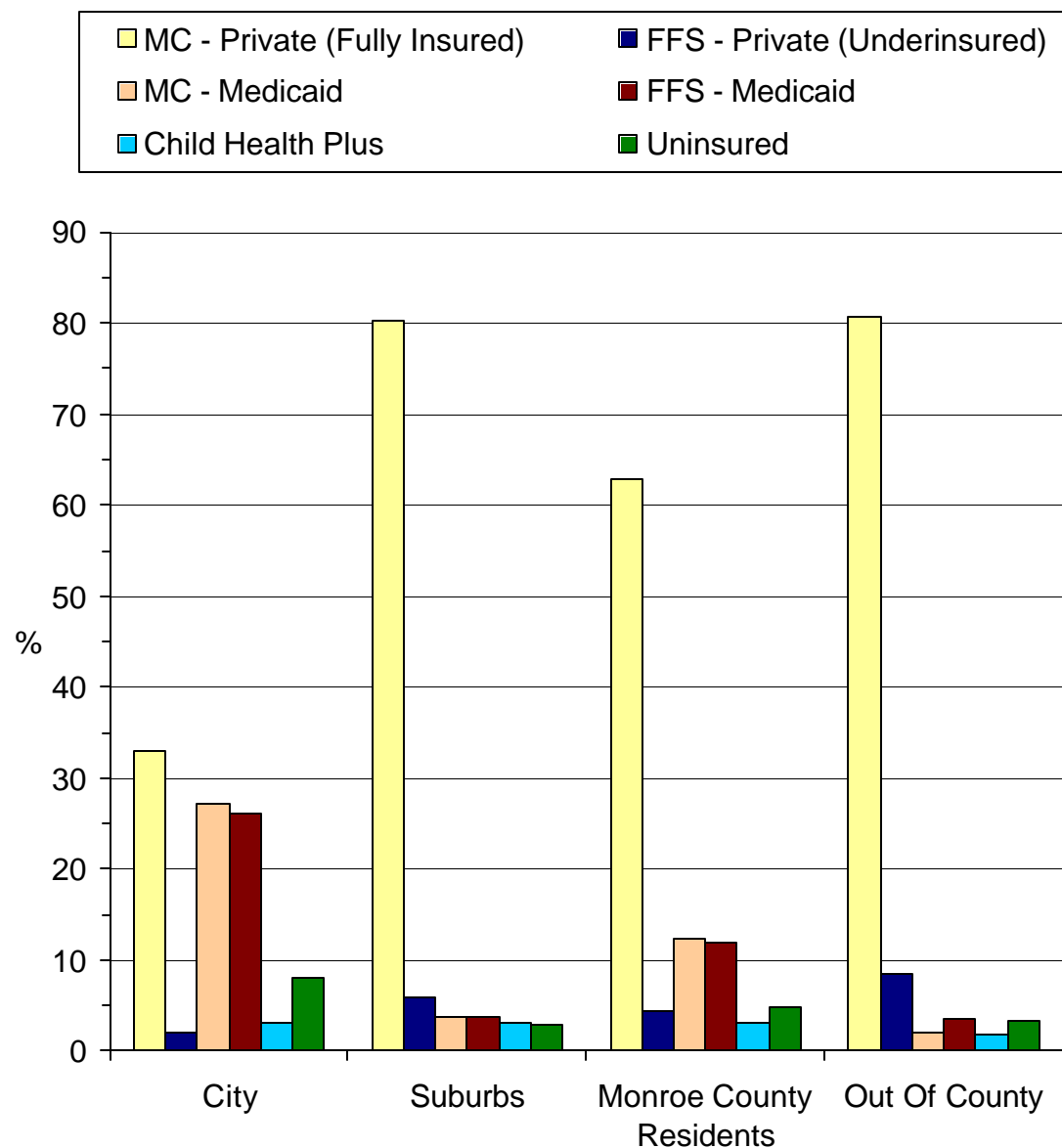
The insurance coverage of children is shown in Table 8 and Figure 6. Throughout Monroe County, 63% of children were covered by commercial managed care, 4% by indemnity insurance, and 24% by Medicaid (evenly split between Medicaid managed care and traditional fee-for-service Medicaid). Child Health Plus covered 3% of Monroe County's children. In 1999, only 5% of 2 year old children were uninsured. In the city of Rochester, 33% of children were covered by commercial managed care, 2% by indemnity insurance, and 53% by Medicaid (half of these Medicaid managed care, and half traditional fee-for-service Medicaid). In addition, 8% of city children were uninsured. In the suburbs, 80% were covered by commercial managed care plans, 6% by commercial indemnity plans, and 7% by Medicaid (again with an even split between managed care and traditional), with 3% of children being uninsured.

It is important to note that insurance status was obtained from a combination of computerized billing files and medical charts, and reflects the most recent insurance of these children. For any particular child, the insurance status may change throughout the year. However, this method of determining insurance status should be accurate for the entire child population

Summary:

- **Only 5% of children living in Monroe County, and 8% of children living in the city of Rochester are uninsured (500 children for each birth cohort)**

Figure 6
Type of Health Insurance by Geographic Region



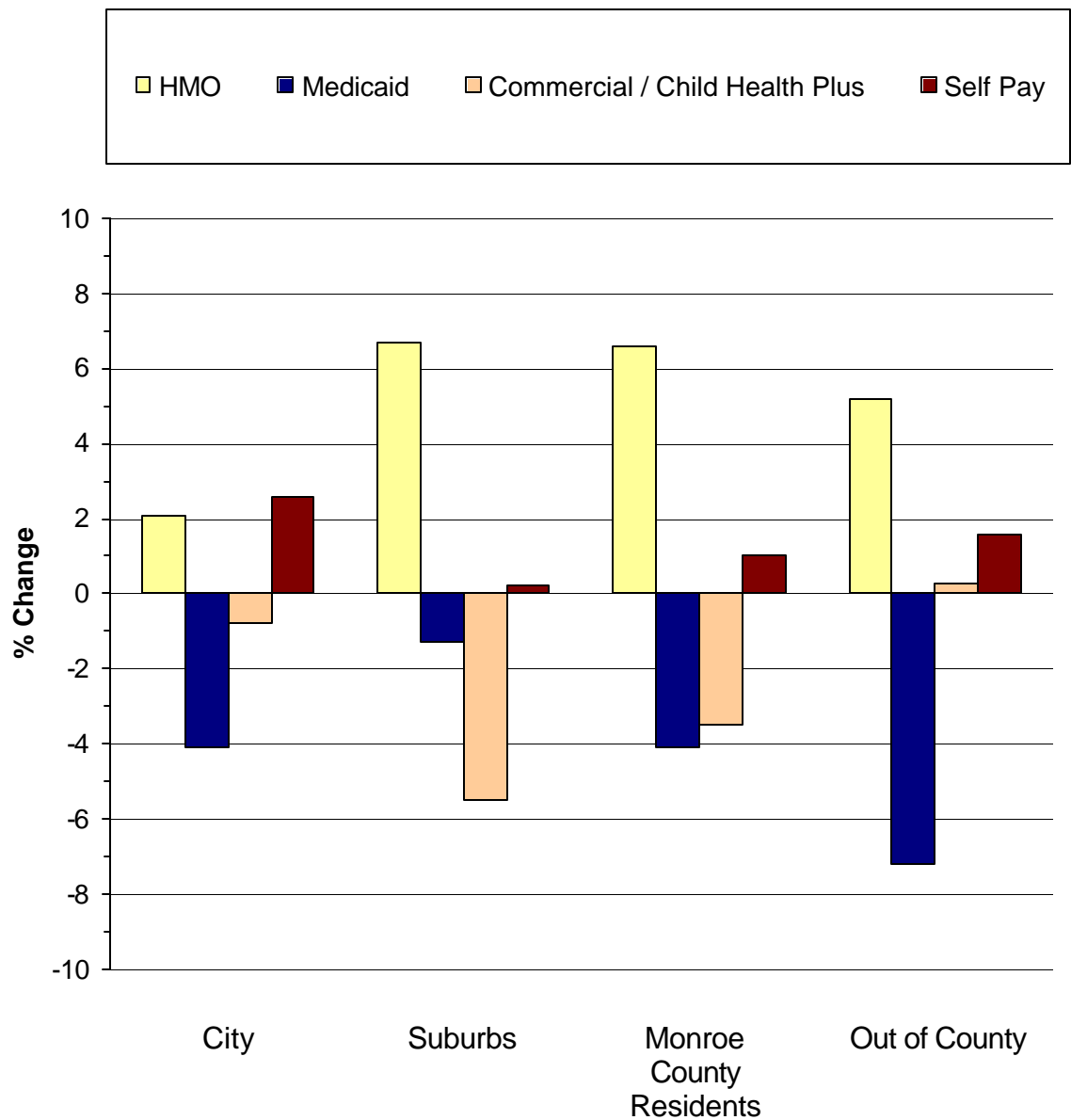
Change in Type of Health Insurance:

The insurance coverage of children in 1999 was similar to coverage in 1996, with some increases in the penetration of managed care (HMO) and some decline in Medicaid coverage. For all Monroe County residents, commercial managed care increased from 56% to 63% at the expense of commercial indemnity insurance (which has been nearly eliminated in Monroe County). Medicaid coverage decreased slightly from 28% to 24% county wide, and the uninsured rate remained about the same at nearly 5%. For the city of Rochester, Medicaid coverage declined slightly from 57% to 53%, and the uninsured rate increased slightly from 6% to 8%. In the suburbs, commercial managed care increased from 74% to 80%, and Medicaid coverage may have declined slightly from 9% to 7%, with the uninsured rate remaining constant at around 3%.

Summary:

- *Since 1996, the uninsured rate has remained relatively constant, and the proportion of children on Medicaid has declined slightly*
- *Medicaid covers half of the children in the city of Rochester, and one-quarter of the children in Monroe County*
- *Managed care now covers three-quarters of the children in Monroe County*

Figure 7
Percent Change in Type of Health Insurance From 1996 To 1999
by Geographic Region



Geographic Areas of Analysis:

Figure 8 shows a map of Monroe County, divided into the “Inner City,” “Rest of the City,” and “Suburbs.” The “inner city” includes census tracts in which more than 50% of children have Medicaid. The “rest of the city” is the remainder of the city of Rochester. We used these areas for analysis in the 1993 and 1996 surveys, and use it here for meaningful comparison.

As shown in Table 17 (Appendix 4), children in the “inner city” are most likely to be in a minority group and to be on Medicaid: 58% are black, 21% are Hispanic, 64% are covered by Medicaid, and 8% are uninsured. Children living in the “rest of the city” also have a high rate of being in a minority group (37% black, 15% Hispanic), and being on Medicaid (38%) or uninsured (7%).

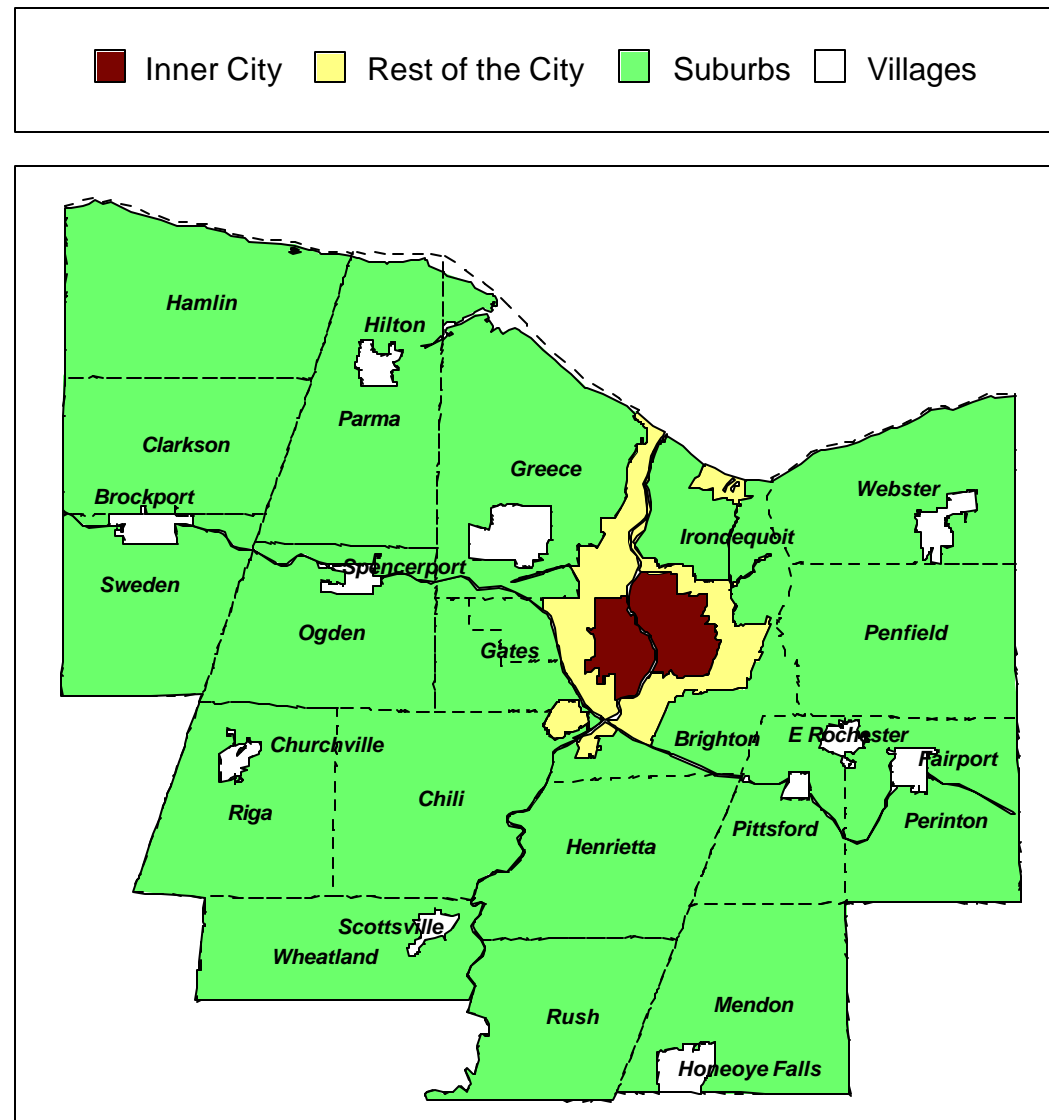
As shown in Table 18 (Appendix 4), the city of Rochester can be further divided into “central city” and four quadrants. Children in the “central city” are most likely to be in a minority group; those in the “northeastern city” are most likely to be uninsured.

As shown in Table 19 (Appendix 4), children from the four suburban quadrants of Monroe County have similar characteristics.

Summary

- *It is useful to divide Monroe County geographically into “inner city,” rest of the city,” and “suburbs” in order to better focus interventions*
- *The most vulnerable children live in the “inner city”*

Figure 8
Areas of Monroe County



Changes in Immunization Rates:

Table 9 and Figures 9-11 that follow show the up-to-date rates for individual immunizations and combinations of vaccines for 1993, 1996, and 1999. Immunization rates are shown for children who live in the city and suburbs, as well as for children from outside of the county who receive their primary health care in Monroe County practices.

Tables 22-24 (Appendix 6) show the change in immunization rates, in 1993, 1996, and 1999, in specific geographic quadrants of the city and specific quadrants of the suburbs.

Summary for all of Monroe County:

- ***Overall, immunization rates have increased by several percentage points since 1996.***
- ***Up-to-date rates at 12-months of age have increased to 90% for DTP₃/Polio₂/Hib₃/HepB₂, an increase of eight (8) percent between 1996 and 1999.***
- ***Up-to-date rates at 24-months of age have increased to 85% for DTP₄/Polio₃/MMR₁/Hib_(≥12m)/HepB₃, an increase of ten (10) percent between 1996 and 1999***
- ***These immunization rates use the most stringent criteria for being up-to-date for 12 and 24 month old children, as defined by the CDC.***

Table 9 Up-to-Date Rates (Percent) - For 1993 vs 1996 vs 1999 By Geographic Region																
		Children in the City of Rochester			Children Living in the Suburbs			All Children Living in the County			Children from Outside the County			All Children Seen in the County		
		93 4,512	96 4,316	99 3,795	93 4,984	96 6,292	99 6,271	93 9,496	96 10,612	99 10,066	93 1,048	96 1,376	99 1,326	93 10,544	96 11,984	99 11,392
At 12 Months of Age	DTP ₃	81	88	93	94	97	96	88	92	95	93	95	94	88	92	95
	Polio ₂	93	95	98	97	99	98	95	97	98	97	97	99	95	97	98
	Hib ₃	72	86	88	88	95	92	81	90	91	86	94	90	81	90	91
	HepB ₂	-	90	98	-	89	97	-	89	98	-	88	97	-	89	98
	DTP ₃ /Polio ₂ /Hib ₃	72	86	88	88	95	92	80	90	91	85	94	90	81	90	90
	DTP ₃ /Polio ₂ /Hib ₃ /HepB ₂	-	79	87	-	86	91	-	82	90	-	85	89	-	82	90
At 24 Months of Age	DTP ₄	71	82	91	83	91	95	77	86	93	78	88	90	77	86	93
	Polio ₃	75	89	96	85	96	96	80	92	96	82	90	94	80	92	95
	MMR ₁	85	87	96	93	95	97	89	90	96	85	92	96	89	91	96
	Hib ₄	66	82	85	82	90	89	74	85	87	74	90	86	74	86	87
	HepB ₃	-	87	96	-	90	96	-	88	96	-	90	95	-	88	96
	DTP ₄ /Polio ₃ /MMR ₁	69	79	89	80	89	93	75	83	91	75	85	90	75	83	91
	DTP ₄ /Polio ₃ /MMR ₁ /Hib ₃ /HepB ₃	-	-	87	-	-	89	-	-	88	-	-	88	-	-	88
	DTP ₄ /Polio ₃ /MMR ₁ /Hib ₄	-	76	81	-	85	86	-	80	84	-	83	84	-	80	84
	DTP ₄ /Polio ₃ /MMR ₁ /Hib ₄ /HepB ₃	-	-	80	-	-	84	-	-	83	-	-	83	-	-	83
	DTP ₄ /Polio ₃ /MMR ₁ /Hib _(≥12m)	58	77	83	73	85	89	66	81	87	66	84	88	66	81	87
	DTP ₄ /Polio ₃ /MMR ₁ /Hib _(≥12m) /HepB ₃	-	72	82	-	80	87	-	75	85	-	78	85	-	75	85

Changes in Immunization Rates:**At 12 Months of Age:**

As shown in Table 9 and Figure 9, immunization rates have risen steadily for nearly all individual vaccines.

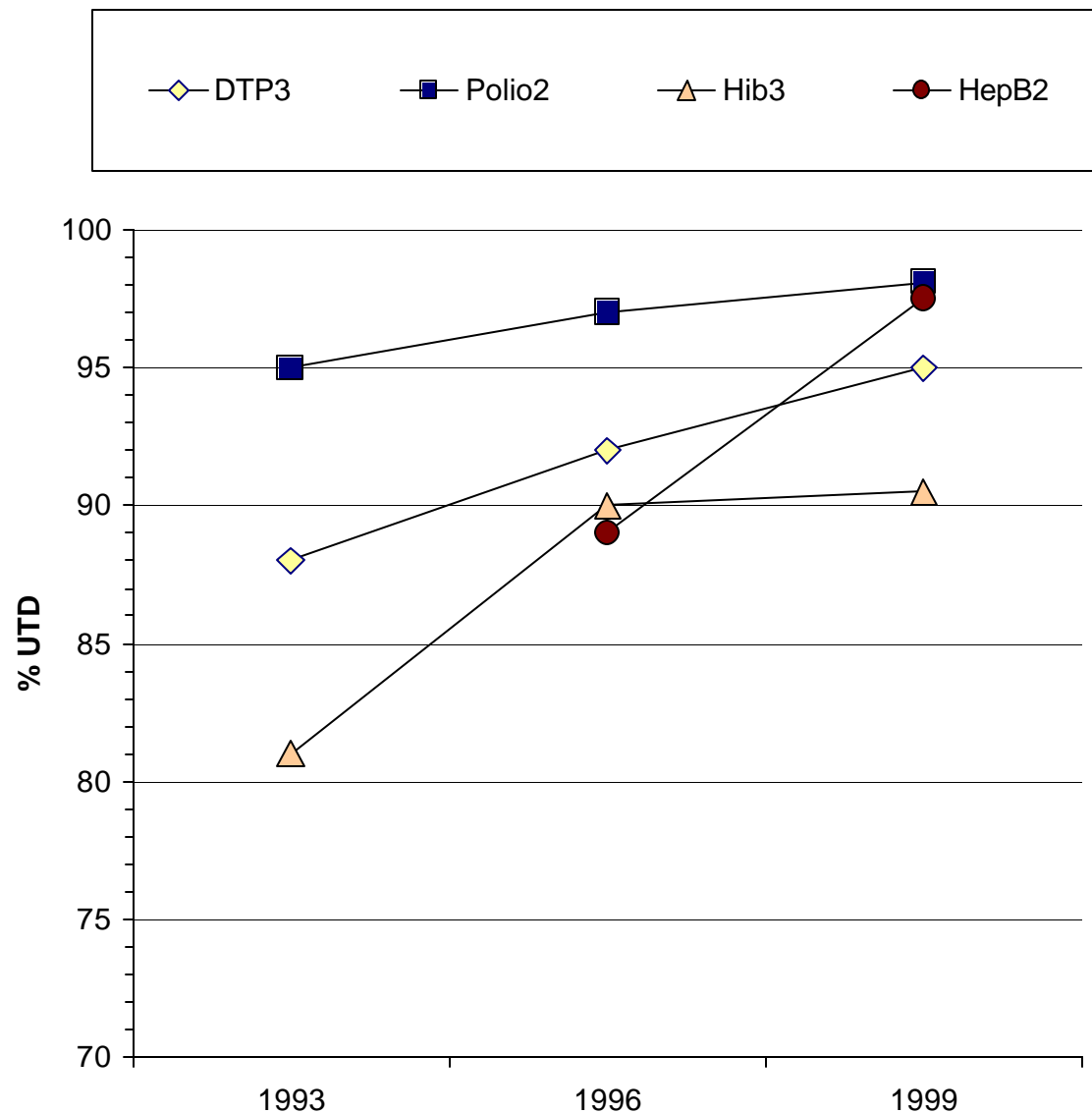
In particular, immunization rates for Hepatitis B increased substantially so that by 12 months more than 97% of children in Monroe County had received two Hepatitis B vaccinations.

The very slight decline in Hib rates in the suburbs between 1996 and 1999 and the leveling off for the entire county may be related to the availability of new Hib vaccine combinations and associated schedules for administration (such as Comvax).

Summary:

- *Up-to-date rates for individual vaccines rose steadily between 1993, 1996, and 1999.*
- *Hepatitis B rates rose substantially in 1999, to over 95% by 12 months.*
- *More than 90% of 12-month olds in Monroe County are up-to-date in 1999 for individual vaccines*

Figure 9
Trends in Individual Vaccine Up-to-Date Rates (UTD)
At 12 Months of Age



Changes in Immunization Rates:**At 24 Months of Age:**

As shown in Table 9 and Figure 10, immunization rates rose for the five individual vaccines in nearly all geographic regions and for the entire county.

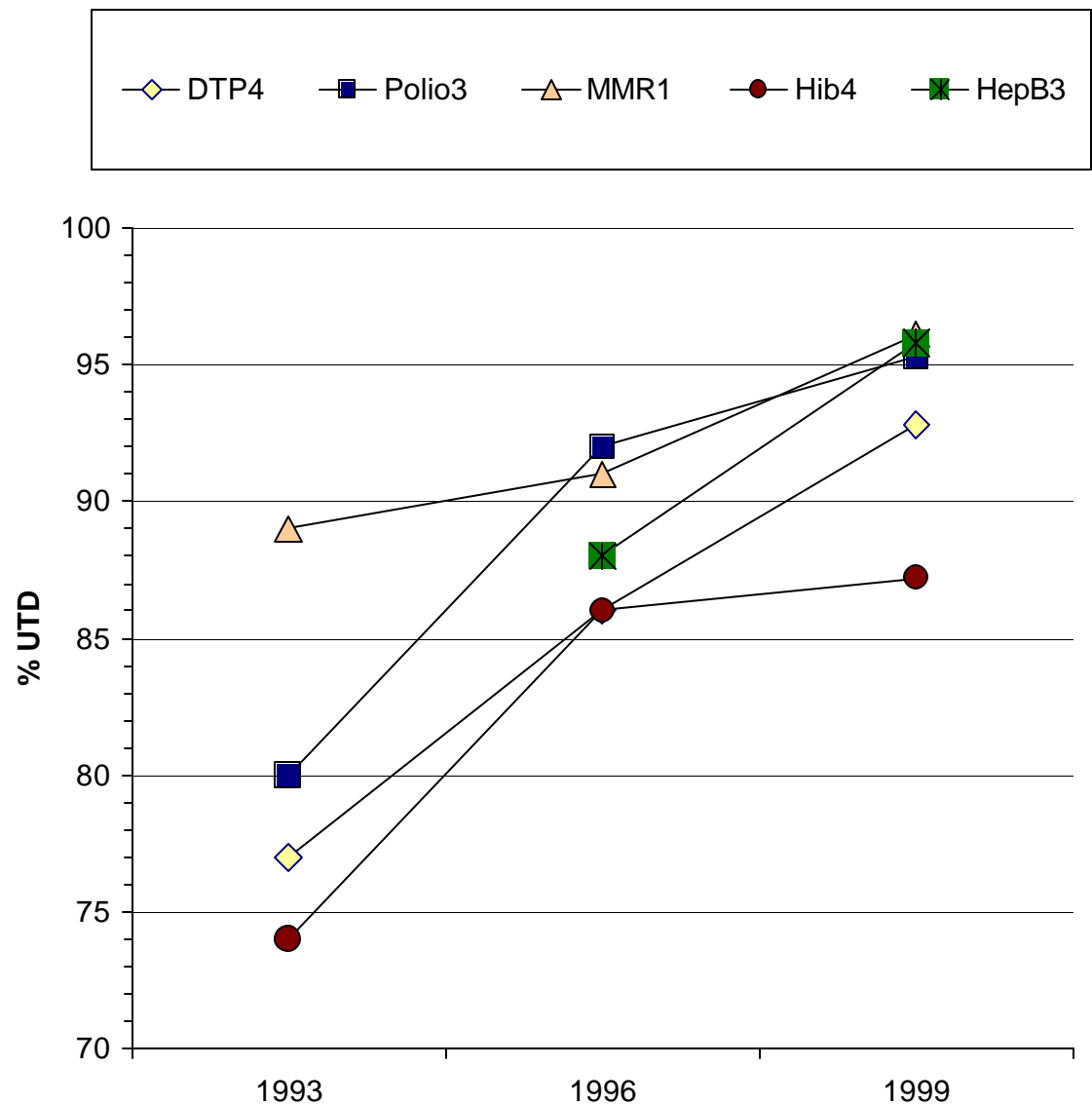
Hepatitis B vaccination rates rose substantially, so that 96% of 24-month olds in Monroe County had received 3 Hepatitis B vaccinations in 1999.

Rates for the other individual vaccines were also well above the national rate of 90%. Hib₄ rates may again have been artificially affected by different vaccine schedules.

Summary:

- *Up-to-date rates for individual vaccines rose steadily between 1993, 1996, and 1999.*
- *More than 90% of 24-month olds in Monroe County are up-to-date in 1999 for all individual vaccines (slightly less for the fourth Hib vaccine)*

Figure 10
Trends in Individual Vaccine Up-to-Date Rates (UTD)
At 24 Months of Age



Up-to-Date Rates: 1993 vs 1996 vs 1999

Table 9, Table 22 (in Appendix 6), and Figure 11 at the right show the trend in up-to-date rates between 1993, 1996, and 1999 for 24-month olds for the main combination schedule which was available back in 1993 ($DTP_4/Polio_3/MMR_1/Hib_{(>12m)}$), not including Hepatitis B).

There has been a steady increase in immunization rates across this 6-year period for both 12-month and 24-month olds. This increase has occurred in all parts of Monroe County.

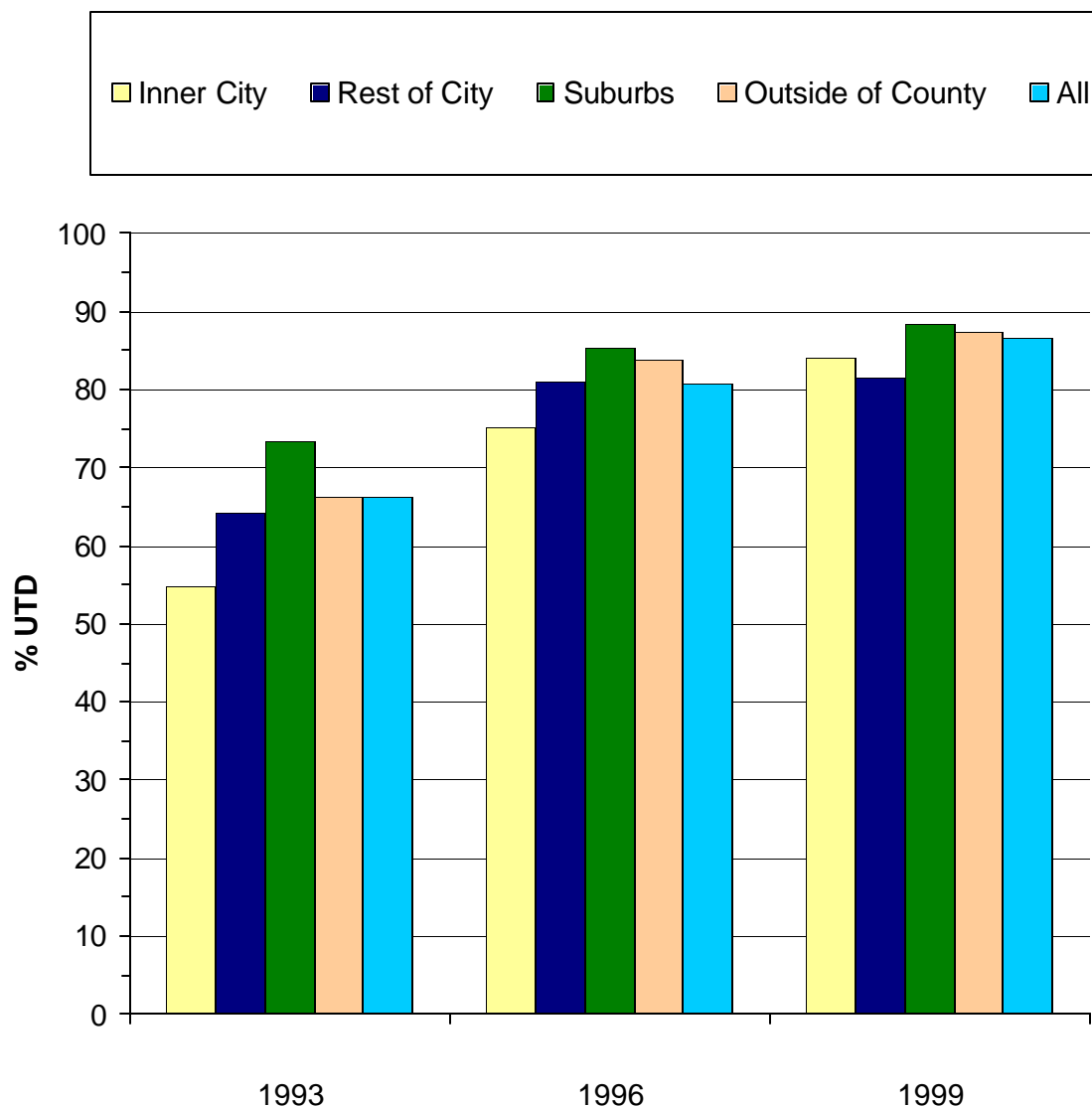
The increase in immunization rates was greater between 1993-1996 than between 1996-1999.

The increase in immunization rates continues to be greatest in the inner city, less in the rest of the city, and slow but steady in the suburbs.

Summary:

- *Immunization rates continued a steady increase in all parts of Monroe County*
- *Greatest increases in immunization rates occurred in the inner city, where the most vulnerable children reside*

Figure 11
Up-to-Date Rates (UTD)
For $DTP_4/Polio_3/MMR_1/Hib_{(>12m)}$ At 24 Months of Age
Comparing 1993 vs 1996 vs 1999 By Geographic Region



Change in Rates 1996 vs 1999:

As shown in Table 9, Table 22 (Appendix 6) and Figure 12, immunization rates rose steadily between 1996 and 1999, with the greatest rise in the inner city.

Up to date rates at 12 Months of Age (DTP₃/Polio₂/Hib₃/HepB₂):

Immunization rates rose by 9% in the inner city (78% to 87%), 5% in the suburbs (86% to 91%), and by nearly 8% for all children served in Monroe County practices (82% to 90%).

Up to date rates at 24 Months of Age (DTP₄/Polio₃/MMR₁/Hib_(≥12m)/HepB₃):

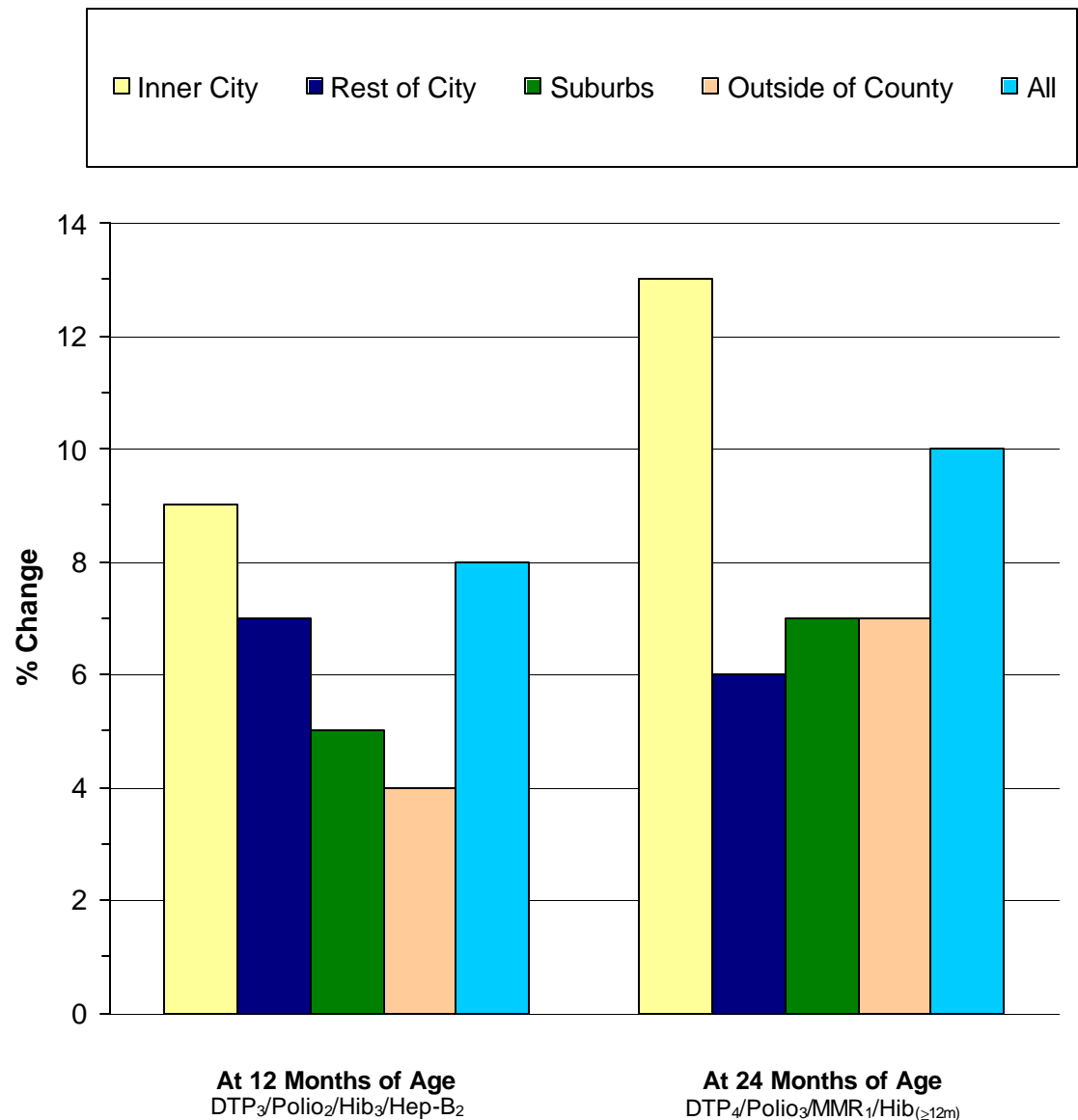
Immunization rates rose by 13% in the inner city (70% to 83%), 7% in the suburbs (80% to 87%), and nearly 10% for all children served in Monroe County practices (75% to 85%).

The finding that immunization rates rose more in the city than in the suburbs may be due in part to the fact that baseline immunization rates in the city were lower than in the suburbs. Another possible cause is the extensive outreach program targeting practices that serve the inner city.

Summary (Between 1996 and 1999):

- *Immunization rates at 12 months of age increased by 4-9%.*
- *Immunization rates at 24 months of age increased by 6-13%.*
- *Greatest rise in rates occurred in the inner city (9-13%)*

Figure 12
Change In Up-to-Date Rates (UTD)
From 1996 to 1999 By Geographic Region



Rate of Rise in Immunization Rates

The rate of rise in immunization rates will naturally slow down as immunization rates approach 100%, because it becomes increasingly difficult to raise rates even further on top of high baseline rates.

Figure 13 (and Table 22) show the change in immunization rates for children at 24-months of age between 1993-1996, and between 1996-1999, for different parts of Monroe County. These numbers represent the combination of vaccines not including Hepatitis B (which was not given in 1993).

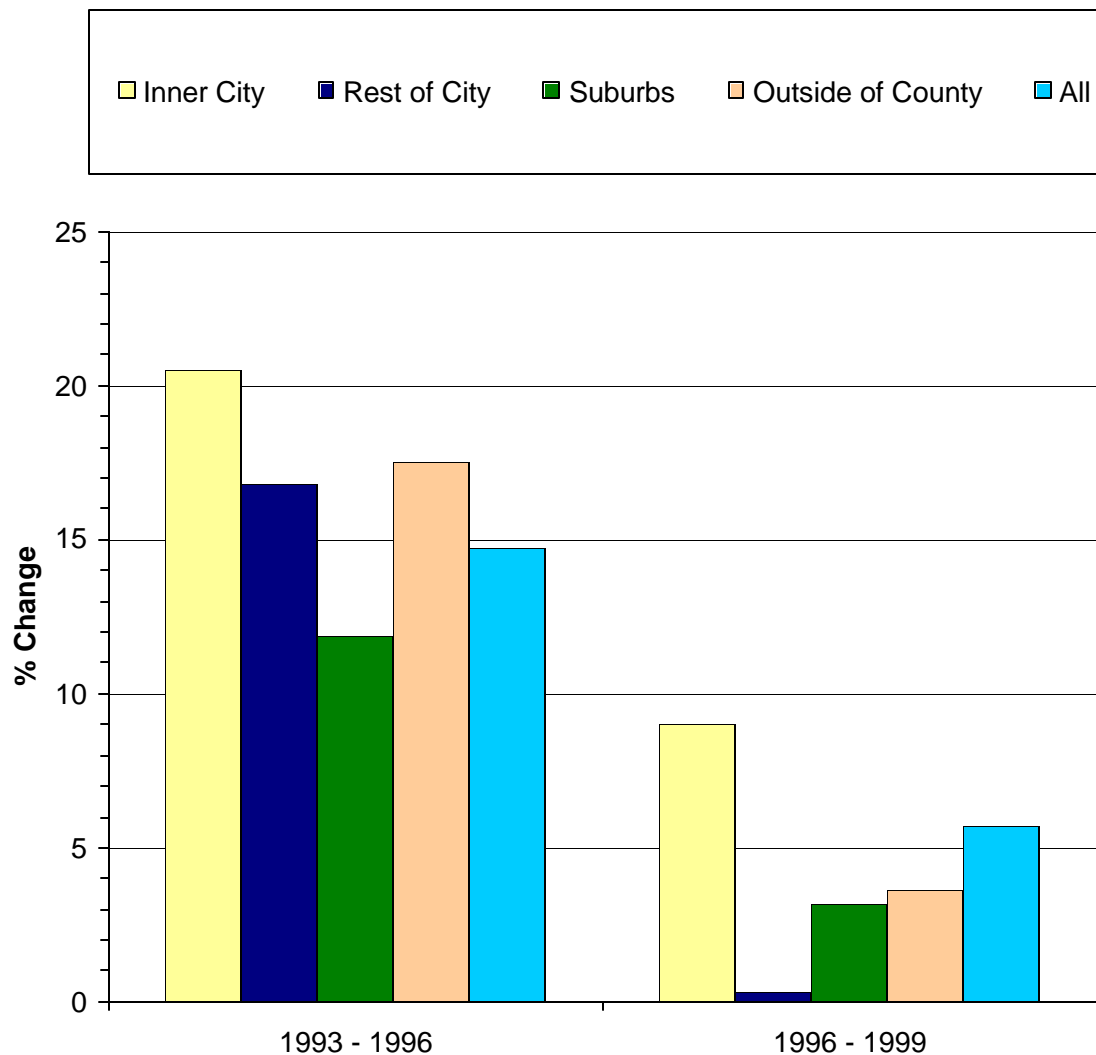
In the inner city, immunization rates for DTP₄/Polio₃/MMR₁/Hib_(≥12m) rose by 20% between 1993-1996 (55% to 75%), and by 9% between 1996 and 1999 (75% to 84%). In the suburbs, rates rose by 12% between 1993-1996 (73% to 85%), and by 3% between 1996 and 1999 (85% to 88%). For all children served in Monroe County practices, rates rose by 15% between 1993-1996 (66% to 81%), and by 6% between 1996 and 1999 (81% to 87%).

Overall, the rate of rise in immunization rates in the inner city is double that of the suburbs, but rates were lower at baseline.

Summary:

- *The rate of rise in immunization rates has slowed in the past 3 years*
- *The rate of rise in immunization rates continues to be greater in the inner city, where baseline rates were lowest*
- *It will become increasingly difficult to raise rates as coverage is now so high*

Figure 13
Change In Up-to-Date Rates (UTD)*
From 1993 - 1996 versus 1996 - 1999
For Children at Age 24 Months, By Geographic Region



* Based on Up-To-Date for DTP₄/Polio₃/MMR₁/Hib_(≥12m) at 24 Months of Age.

New Immunizations and Schedules

Nationally, there is substantial concern that the licensure and implementation of the recommendations for new vaccinations might have several negative effects, including (a) slow adoption of the new vaccines, (b) deferment of more traditional vaccines, and (c) overall “burn-out” among primary care physicians about immunizations, which may lead to reduced coverage rates.

Between 1996 and 1999, several major new recommendations were implemented. These included:

- Universal Hepatitis B vaccination for infants that was introduced in 1991 but increasingly recommended in the 1990s
- Change in 1999 from OPV to IPV, which involved 4-5 additional shots
- Recommendation for universal varicella immunization, in 1991, new guidelines published in 1996
- Rotavirus immunization, recommended for the 1999 Immunization schedule, but withdrawn in October 1999

Although this study cannot determine barriers to implementation of new vaccines, we can estimate the degree to which new guidelines were adopted.

Summary:

- *Hepatitis B coverage was nearly 100%*
- *The change from OPV to IPV did not lower immunization rates for polio*
- *Varicella coverage probably was relatively low, but difficult to measure*

Hepatitis B Vaccination

Hepatitis B was recommended for universal infant immunization in 1991 and promoted heavily later during the 1990's. Since 1996, coverage has increased markedly for all children residing in Monroe County, as shown to the right.

This community rapidly adopted universal Hepatitis B immunization, and rates have now risen to extraordinarily high levels. In addition, Monroe County is unusual in that the first dose of Hepatitis B is not routinely administered in the newborn nursery, but rather in the primary care provider's office. There is evidence nationally that administration of Hepatitis B in the newborn nursery may lead to higher rates by 2 years of age. In this community, such a strategy is unnecessary. High rates are clearly due to nearly universal access to primary care, and closely following the recommendations.

Change from OPV to IPV

In December 1999, the ACIP, AAP, and AAFP recommended a switch to universal IPV due to a small number of cases (4-8 nationally) of paralytic polio linked to OPV. The change in schedule involved 3-4 additional injections, and there has been concern that this might reduce coverage for polio or other vaccines. Nationally, and in Monroe County, many practices actually began to use IPV early in 1999.

In spite of the schedule change, coverage levels for polio have increased for all children residing in Monroe County, since 1996. The shift to IPV has not resulted in a reduction in rates of polio, or other vaccinations.

Varicella Immunization

In 1996, varicella vaccine was recommended for universal use (updated recommendations published in February and May 1999). Since that time, there has been some resistance and apparently slow adoption of the vaccine. The 1998 NIS found a 45% national coverage rate for 19-35 month olds – a cohort similar to this survey's cohort. Of note, coverage levels for 19-35 month olds tends to be higher than coverage levels for 24-month olds, which is the age group standard used throughout this survey.

We did chart review for varicella vaccine, and our numbers should accurately reflect the vaccination rate. However, we did not determine, whether each sampled child ever had chickenpox, primarily because we knew at that time, that the charts were very incomplete for this measure. Thus, our finding probably underestimates the percent of children who were vaccinated or had chicken pox.

Coverage for varicella immunization at 24 months was:

	1996	1999
12 month: Hep B2	89%	98%
24 month: Hep B3	88%	96%

	1996 Mostly OPV	1999 OPV & IPV
12 month: Polio 2	97%	98%
24 month: Polio 3	92%	96%

Inner City	Rest of City	All City	Suburbs	Monroe County
54%	49%	52%	44%	47%

Immunization Rates – 1999

Tables 10 and 11 shows up-to-date rates for 1999 for the city of Rochester, suburbs, all children living in Monroe County, children from outside the county who are served by Monroe County practices, and all children served in Monroe County practices. Tables 20-21 in Appendix 5 show rates for more detailed geographic areas (e.g., inner city).

Rates and confidence intervals are shown for individual vaccines and for combinations of vaccines. Figures 14 and 15 display rates graphically for 12 month-olds, and Figures 16 and 17 display results for 24 month-olds.

The relatively narrow confidence intervals around rates reflect the large sample sizes from each geographic region. For example, for all children served in Monroe County practices, the rate at 24 months in 1999 for DTP₄/Polio₃/MMR₁/Hib_(≥12m)/HepB₃ is 85.0% (95% confidence interval 81.4-88.0%). Thus, with 95% confidence, the true rate lies between 81.4 and 88.0%.

Summary – Most Relevant Rates:

• **At 12 Months: It is best to use**
DTP₃/Polio₂/Hib₃ *vs prior years*
DTP₃/Polio₂/Hib₃/HepB₃ *best current rates*

• **At 24 Months: It is best to use**
DTP₄/Polio₃/MMR₁/Hib_(≥12m) *vs prior years*
DTP₄/Polio₃/MMR₁/Hib_(≥12m)/HepB₃ *best current rates*
DTP₄/Polio₃/MMR₁/Hib₃/HepB₃ *vs NYS, USA rates*

Table 10 Up-to-Date Rates (1999) By Geographic Region											
		Children in the City of Rochester		Children Living in the Suburbs		All Children Living in the County		Children from Outside the County		All Children Seen in the County	
		N @ 3,795		N @ 6,271		N @ 10,066		N @ 1,326		N @ 11,392	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
At 12 Months of Age	DTP ₃	93.1	91.1	96.4	94.5	95.1	93.4	94.4	88.4	95.0	93.3
			94.7		97.6		96.4		97.4		96.4
	Polio ₂	97.5	96.1	98.3	96.7	98.0	96.8	99.4	97.5	98.1	97.1
			98.4		99.1		98.7		99.8		98.8
	Hib ₃	88.0	82.8	92.2	88.7	90.6	87.5	89.6	80.9	90.5	87.4
			91.8		94.7		93.1		94.6		92.9
	HepB ₂	98.2	96.9	97.3	95.0	97.6	96.0	96.6	91.7	97.5	96.0
			98.9		98.5		98.6		98.7		98.5
DTP ₃ /Polio ₂ /Hib ₃	87.7	82.7	92.2	88.7	90.5	87.4	89.6	80.9	90.4	87.3	
		91.4		94.7		92.9		94.6		92.8	
DTP ₃ /Polio ₂ /Hib ₃ /HepB ₂ *	87.4	82.4	90.9	87.0	89.6	86.2	88.9	80.6	89.5	86.2	
		91.1		93.8		92.2		93.9		92.1	
At 24 Months of Age	DTP ₄	90.5	87.7	94.8	92.1	93.2	91.0	90.2	83.6	92.8	90.6
			92.7		96.6		94.9		94.3		94.6
	Polio ₃	95.5	91.8	95.5	92.4	95.5	93.2	93.8	87.1	95.3	93.1
			97.6		97.4		97.1		97.1		96.8
	MMR ₁	95.6	93.3	96.6	93.9	96.2	94.3	95.5	89.5	96.1	94.4
			97.1		98.1		97.5		98.2		97.3
	Hib ₃	97.2	95.7	96.9	94.8	97.0	95.7	97.4	93.2	97.1	95.9
			98.2		98.2		98.0		99.0		97.9
	Hib ₄	85.2	79.8	88.5	83.0	87.3	83.1	86.4	76.9	87.2	83.4
			89.4		92.4		90.5		92.3		90.1
	HepB ₃	95.7	93.8	95.9	93.5	95.8	94.2	95.4	88.4	95.8	94.0
			97.0		97.4		96.9		98.3		97.0
	DTP ₄ /Polio ₃ /MMR ₁	88.7	85.1	92.8	89.8	91.3	88.7	90.2	83.6	91.2	88.6
			91.5		95.1		93.3		94.3		93.2
	DTP ₄ /Polio ₃ /MMR ₁ /Hib ₃ /HepB ₃	86.6	82.4	89.1	84.9	88.2	85.2	87.0	78.9	88.0	85.1
			89.9		92.3		90.6		92.3		90.5
DTP ₄ /Polio ₃ /MMR ₁ /Hib ₄	81.2	76.2	85.8	80.3	84.0	80.0	82.4	73.0	83.9	80.0	
		85.3		89.9		87.4		89.0		87.0	
DTP ₄ /Polio ₃ /MMR ₁ /Hib ₄ /HepB ₃	80.1	75.0	84.3	78.7	82.7	78.6	81.3	71.8	82.6	78.6	
		84.4		88.6		86.2		88.2		85.9	
DTP ₄ /Polio ₃ /MMR ₁ /Hib _(≥12m)	83.1	79.1	88.5	83.4	86.5	82.4	87.5	80.6	86.6	83.1	
		86.4		92.2		89.7		92.1		89.4	
DTP ₄ /Polio ₃ /MMR ₁ /Hib _(≥12m) /HepB ₃ *	81.9	77.8	86.7	81.5	84.9	80.8	85.4	77.3	85.0	81.4	
		85.4		90.7		88.3		91.0		88.0	

* Most stringent current rates

Table 11
Up-to-Date Rates (1999)
By Area of the County

		Children in the Inner City		Children in the Rest of the City		Children Living in the Suburbs		All Children Living in the County		Children from Outside the County		All Children Seen in the County	
		N @ 2,247		N @ 1,548		N @ 6,271		N @ 10,066		N @ 1,326		N @ 11,392	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
At 12 Months of Age	DTP ₃	91.9	88.5 94.4	94.8	91.0 97.0	96.4	94.5 97.6	95.1	93.4 96.4	94.4	88.4 97.4	95.0	93.3 96.4
	Polio ₂	97.6	95.5 98.7	97.3	94.0 98.8	98.3	96.7 99.1	98.0	96.8 98.7	99.4	97.5 99.8	98.1	97.1 98.8
	Hib ₃	87.1	78.8 92.5	89.3	85.1 92.4	92.2	88.7 94.7	90.6	87.5 93.1	89.6	80.9 94.6	90.5	87.4 92.9
	HepB ₂	98.8	97.1 99.5	97.3	94.0 98.8	97.3	95.0 98.5	97.6	96.0 98.6	96.6	91.7 98.7	97.5	96.0 98.5
	DTP ₃ /Polio ₂ /Hib ₃	86.8	78.7 92.1	89.0	84.9 92.1	92.2	88.7 94.7	90.5	87.4 92.9	89.6	80.9 94.6	90.4	87.3 92.8
	DTP ₃ /Polio ₂ /Hib ₃ /HepB ₂ [*]	86.8	78.7 92.1	88.3	83.9 91.6	90.9	87.0 93.8	89.6	86.2 92.2	88.9	80.6 93.9	89.5	86.2 92.1
At 24 Months of Age	DTP ₄	89.9	86.5 92.6	91.4	85.4 95.0	94.8	92.1 96.6	93.2	91.0 94.9	90.2	83.6 94.3	92.8	90.6 94.6
	Polio ₃	95.9	92.4 97.9	94.9	88.2 97.9	95.5	92.4 97.4	95.5	93.2 97.1	93.8	87.1 97.1	95.3	93.1 96.8
	MMR ₁	95.4	93.1 97.0	95.9	91.7 98.0	96.6	93.9 98.1	96.2	94.3 97.5	95.5	89.5 98.2	96.1	94.4 97.3
	Hib ₃	97.4	94.8 98.7	96.9	94.8 98.1	96.9	94.8 98.2	97.0	95.7 98.0	97.4	93.2 99.0	97.1	95.9 97.9
	Hib ₄	86.1	76.5 92.2	83.9	78.4 88.2	88.5	83.0 92.4	87.3	83.1 90.5	86.4	76.9 92.3	87.2	83.4 90.1
	HepB ₃	96.1	93.7 97.6	95.2	91.7 97.3	95.9	93.5 97.4	95.8	94.2 96.9	95.4	88.4 98.3	95.8	94.0 97.0
	DTP ₄ /Polio ₃ /MMR ₁	88.5	85.1 91.2	89.1	81.8 93.6	92.8	89.8 95.1	91.3	88.7 93.3	90.2	83.6 94.3	91.2	88.6 93.2
	DTP ₄ /Polio ₃ /MMR ₁ /Hib ₃ /HepB ₃	86.5	82.3 89.9	86.7	79.0 91.9	89.1	84.9 92.3	88.2	85.2 90.6	87.0	78.9 92.3	88.0	85.1 90.5
	DTP ₄ /Polio ₃ /MMR ₁ /Hib ₄	81.7	73.1 87.9	80.5	74.9 85.1	85.8	80.3 89.9	84.0	80.0 87.4	82.4	73.0 89.0	83.9	80.0 87.0
	DTP ₄ /Polio ₃ /MMR ₁ /Hib ₄ /HepB ₃	80.5	71.9 87.0	79.5	73.6 84.4	84.3	78.7 88.6	82.7	78.6 86.2	81.3	71.8 88.2	82.6	78.6 85.9
	DTP ₄ /Polio ₃ /MMR ₁ /Hib _(^c 12m)	84.2	78.9 88.4	81.4	71.0 88.6	88.5	83.4 92.2	86.5	82.4 89.7	87.5	80.6 92.1	86.6	83.1 89.4
	DTP ₄ /Polio ₃ /MMR ₁ /Hib _{(^c 12m)/HepB₃} [*]	83.1	77.7 87.3	80.1	69.6 87.6	86.7	81.5 90.7	84.9	80.8 88.3	85.4	77.3 91.0	85.0	81.4 88.0

* Most stringent current rates

Figure 14
Up-To-Date Rates (UTD) by Geographic Region
For Individual Vaccines at 12 Months

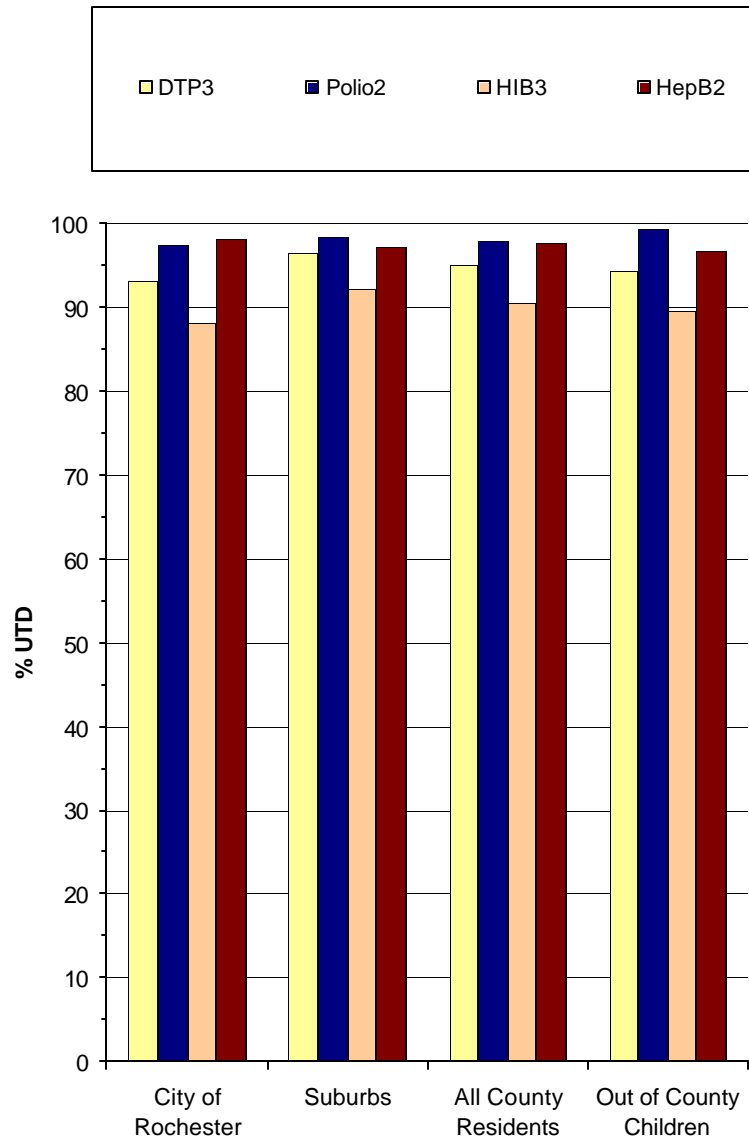


Figure 15
Up-To-Date Rates (UTD) by Geographic Region
For Combination of Vaccines at 12 Months

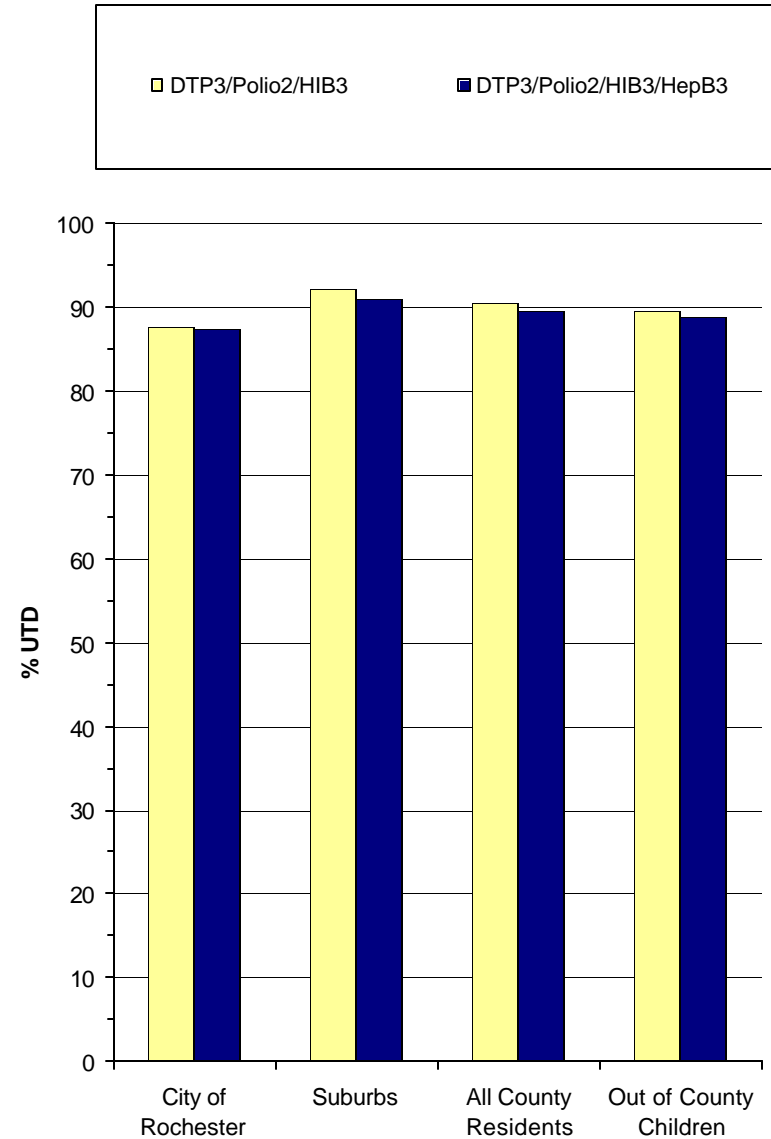


Figure 16
Up-To-Date Rates (UTD) by Geographic Region
For Individual Vaccines at 24 Months

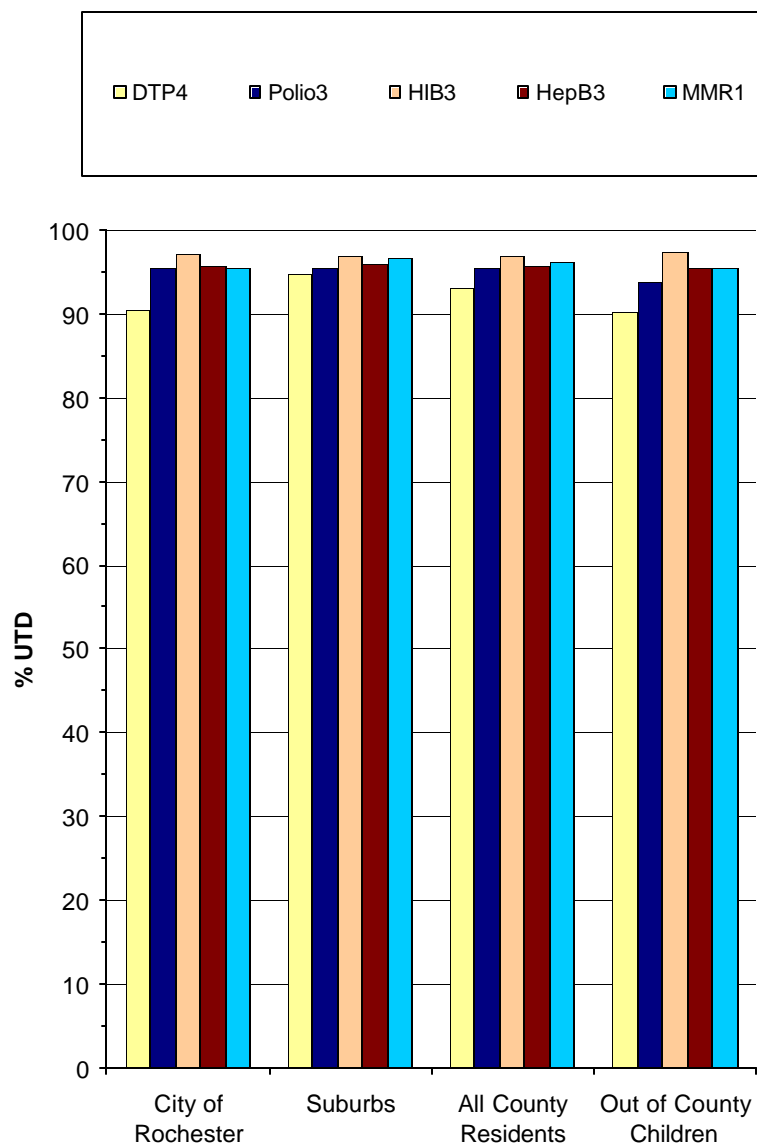
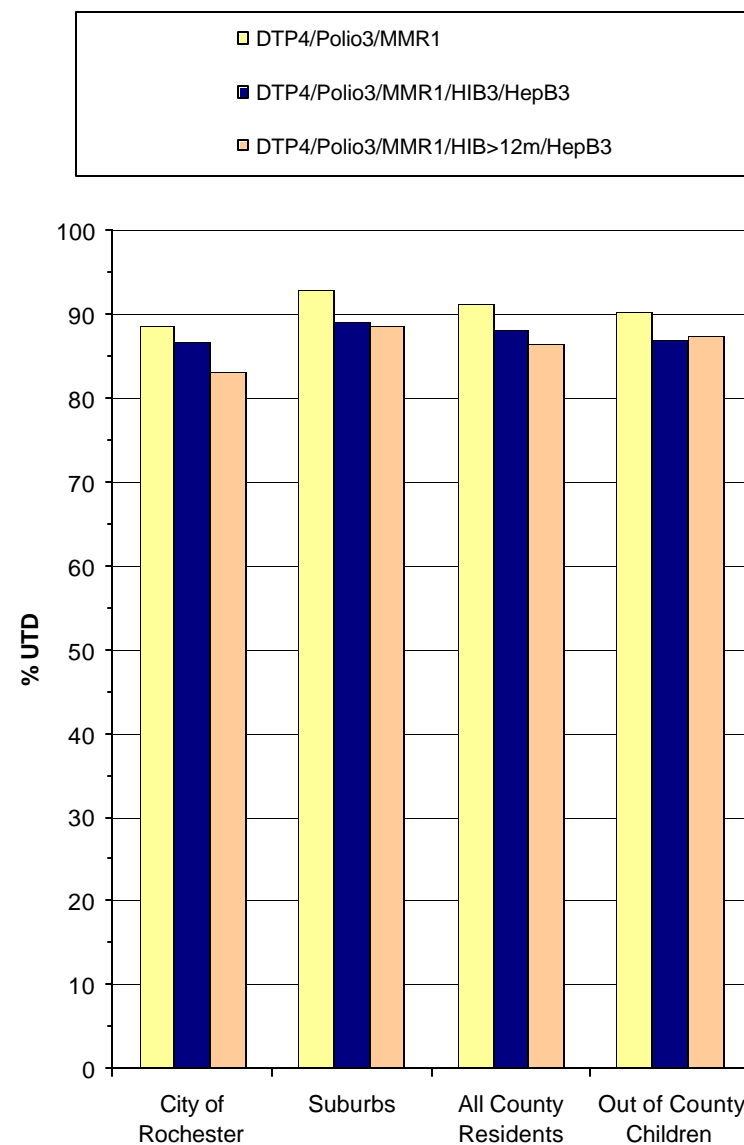


Figure 17
Up-To-Date Rates (UTD) by Geographic Region
For Combinations of Vaccines at 24 Months



Prevention of Disease:

These immunization rates are high enough to prevent disease in most cases. For example, studies have shown that during the 1988-1990 measles epidemic, counties across the U.S. that had higher than 80% coverage among toddlers for measles vaccination did not experience measles cases. MMR coverage rates in all regions of Monroe County are higher than 90%.

Hepatitis B coverage rates are also quite high. Since a significant proportion of children who acquire Hepatitis B during childhood develop the disease during the preschool years, coverage rates of well over 90% for Hepatitis B are very reassuring.

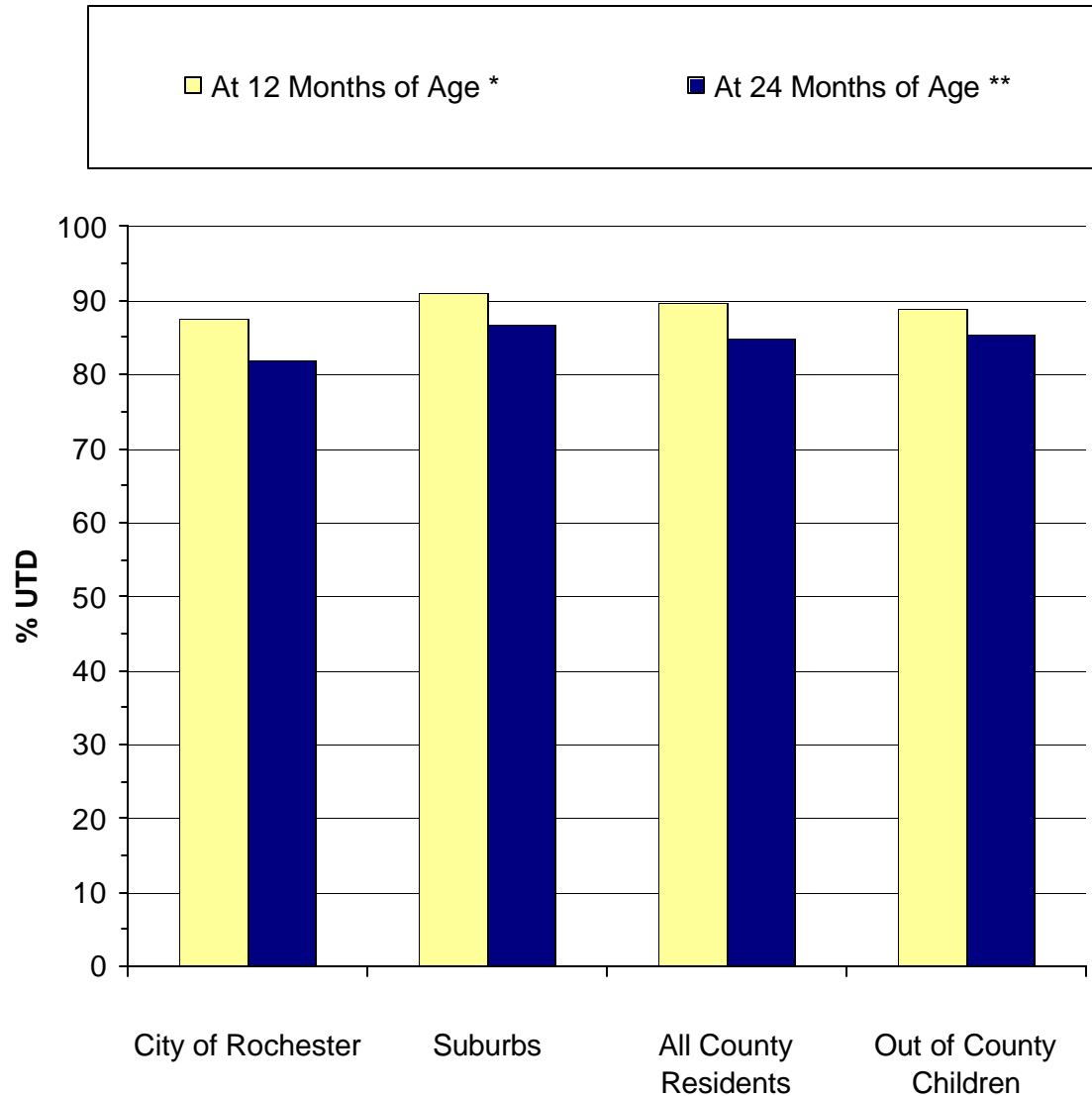
Coverage rates for 4 Hib vaccines or for Hib vaccines after 12 months, are not as high as they could be; however studies from other countries that use only 3 Hib doses suggest that 3 doses, even if none administered after 12 months, are protective. By 12 months of age, more than 90% of children in Monroe County had received 3 Hib vaccines, suggesting a very high rate of protection.

Pertussis is a sporadic vaccine-preventable disease that can occur despite high rates. However, coverage rates for 4 DTP vaccines are now quite high (90-95% at 24 months), and are substantially higher than coverage rates in 1996. This suggests that there may be a decline in pertussis disease among young children in Monroe County.

Summary:

- ***Very high immunization rates are preventing disease in Monroe County***

Figure 18
Up-to-Date Rates (UTD)
By Geographic Region



* DTP₃/Polio₂/Hib₃/Hep-B₂

** DTP₄/Polio₃/MMR₁/Hib_(≥12m)/Hep-B₃

Disparities in Immunization Rates:**City versus Suburbs:**

Tables 11, 12 at the right and 22 (Appendix 6) show differences in immunization rates across geographic regions for 1993, 1996, and 1999. A county wide goal has been to eliminate disparities in immunization rates between children living in the city and those living in the suburbs.

As described above, immunization rates have been climbing faster in the city than in the suburbs. Over time, the gap in rates between the city and suburbs has been narrowing. Figure 19 and Table 12 at the right demonstrate the difference in rates between the inner city and suburbs.

In 1999, immunization rates for children living in the inner city were only 4 to 5% lower than in the suburbs. For example, 24 month old rates for the combination DTP₄/Polio₃/MMR₁/Hib_(≥12m) for children living in the inner city were 84%, compared with 88% for children living in the suburbs.

Summary:

- *Disparities in immunization rates between the inner city and suburbs have narrowed greatly since 1993, from about 20% to 4-5%*
- *We are approaching the elimination of disparities in immunization rates between the city and suburbs*

Figure 19
Percent Difference in Up-to-Date Rates (UTD) Between the Inner City and the Suburbs
1993 versus 1996 versus 1999

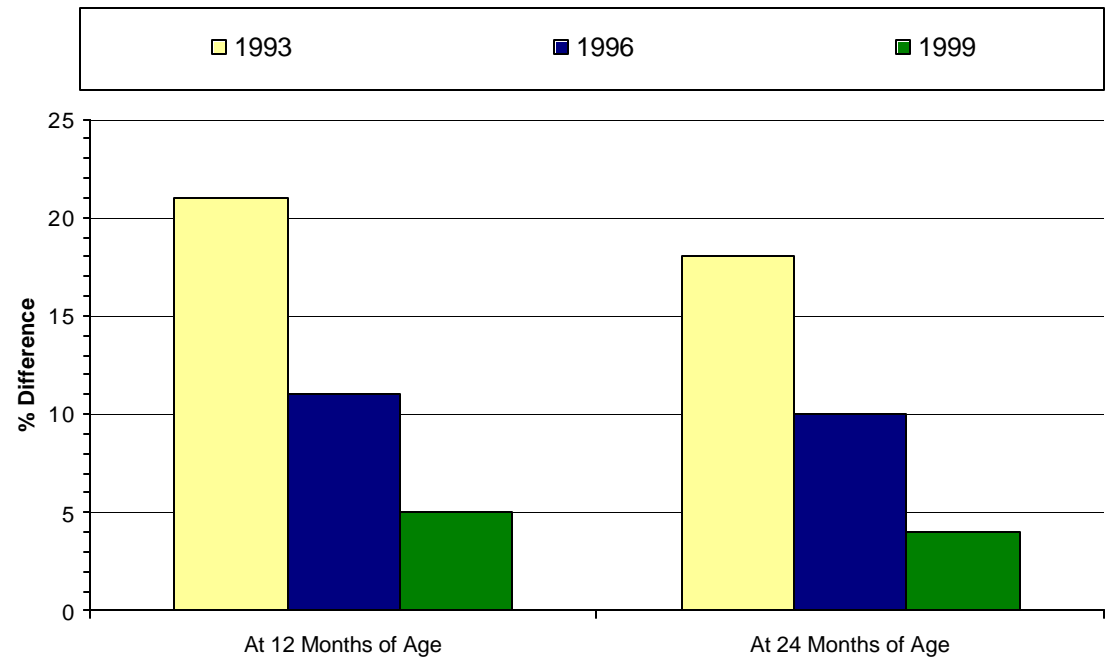


Table 12
Disparities in Immunization Rates: Inner City versus Suburbs
By Year

	At 12 Months of Age DTP3/Polio2/Hib3			At 24 Months of Age DTP4/Polio3/MMr1/Hib(≥12m)		
	1993	1996	1999	1993	1996	1999
Suburbs	88 %	95 %	92 %	73 %	85 %	88 %
Inner City	67 %	84 %	87 %	55 %	75 %	84 %
Difference (Suburbs – Inner City)	21 %	11 %	5 %	18 %	10 %	4 %

Disparities in Immunization Rates:**Specific Quadrants and Areas:**

Tables 20-21 in Appendix 5 display immunization rates for specific quadrants of Monroe County, including the city of Rochester (Northwest, Northeast, Central City, Southwest, Southeast) and the suburbs (Northwest, Northeast, Southwest, and Southeast). Figure 20 shows weighted immunization data by displaying the density of children in Monroe County who are behind in immunizations (more dense dots mean more children behind). Each dot represents a 24-month old child who is behind in immunizations. Locations were obtained from street addresses of children.

Immunization rates within the city of Rochester are actually highest in the central city, while rates in the different quadrants of the city are relatively similar. Appendix 3 shows these quadrants. Immunization rates are very similar for children in the quadrants of the suburbs (Table 21 and Figure 20).

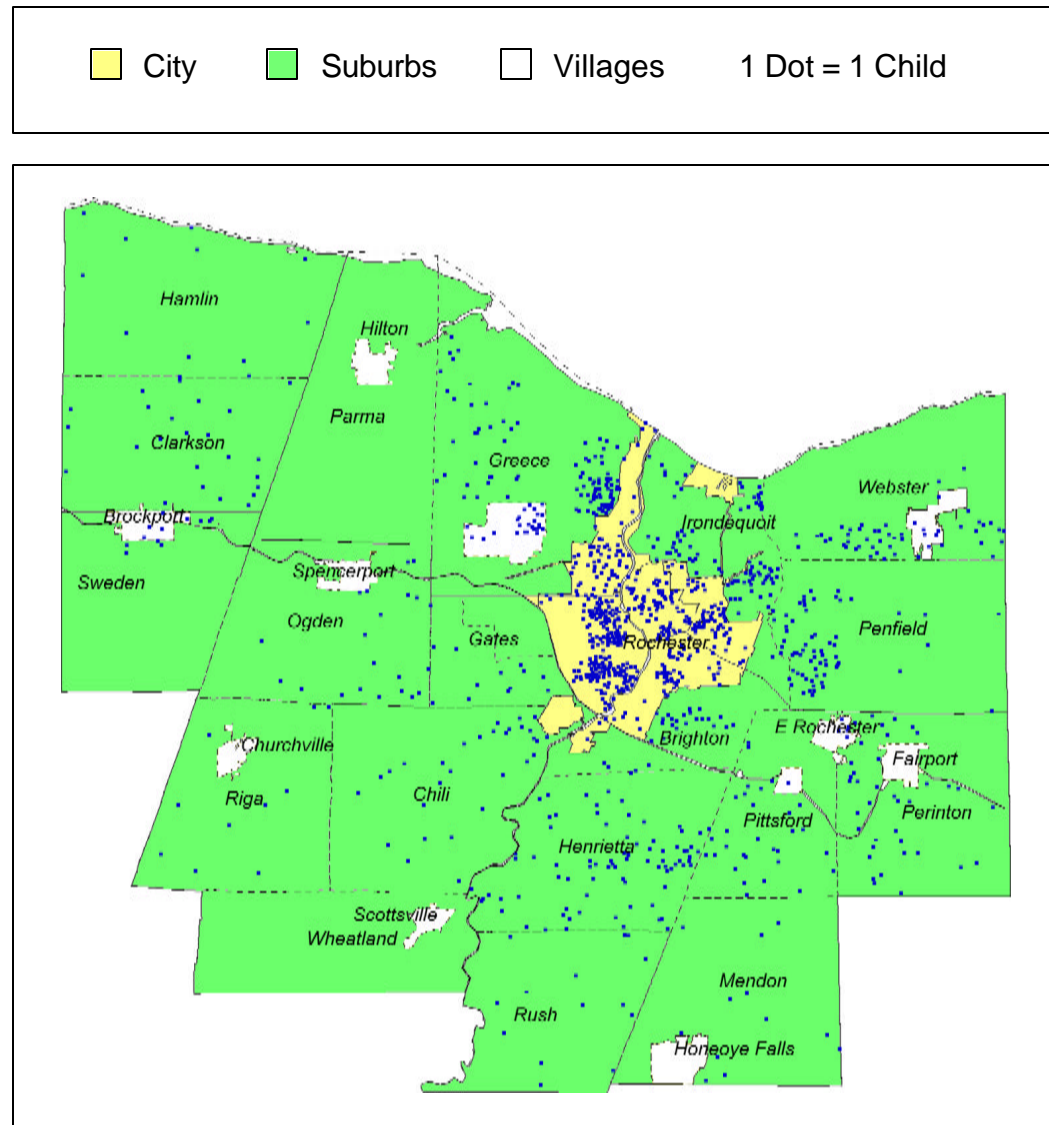
These findings suggest that special efforts targeting specific geographic regions are not indicated, except for the overall effort targeting the city of Rochester.

Summary:

- *Immunization rates are lowest in the city, but relatively similar across quadrants of the city.*
- *Within the city, rates appear to be slightly higher in the central city*
- *Rates in suburbs are uniformly high*
- *Efforts to improve immunization rates should target the entire city*

Figure 20

**Location of Under-Vaccinated Children In Monroe County
For DTP₄/Polio₃/MMR₁/Hib₃/HepB₃ At 24 Months of Age**



Disparities in Immunization Rates:

Impact of Outreach Program:

Immunization rates are slightly higher for children in the inner city compared to children in the rest of the city, and slightly higher for children in the central city compared to children in the four quadrants of the city. This initially appears surprising, given that the inner city has the most high-risk families, however, these results may actually reflect the efforts of the inner city outreach program.

At the time of this survey, the primary care outreach program was in place in 9 inner city practices – intervening most intensely on the highest risk children, during the second year of life. An earlier randomized clinical trial showed that this program increased immunization rates by 10-20%. However the clinical trial ended and now all children in the practices are served by the outreach program.

Because the outreach program serves the most high-risk patients in inner city practices, the fairest way to assess its effect is to compare up-to-date rates for children on Medicaid, in outreach practices versus non-outreach practices. This partially controls for the socio-demographic risk of these children. Table 13 and Figure 21 at the right show these data.

Summary:

For children on Medicaid, there is a trend for those receiving outreach to have higher immunization rates particularly in the 2nd year of life.

Figure 21
Up-to-Date Rates (UTD) For Medicaid Enrolled Children
At 24 Months of Age
With Outreach vs Without Outreach

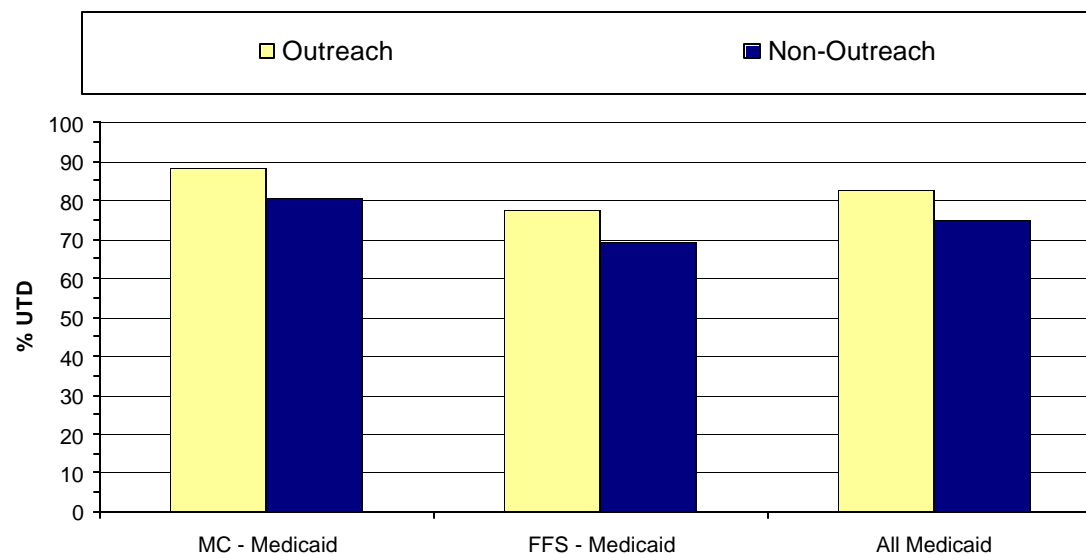


Table 13
Up-to-Date Rates (UTD) For Medicaid Enrolled Children
At 12 Months of Age and At 24 Months of Age
With Outreach vs Without Outreach

	At 12 Months of Age DTP3/Polio2/Hib3/HepB2			At 24 Months of Age DTP4/Polio3/MMR1/Hib(≥12m)		
	Outreach	Non-Outreach	Significance	Outreach	Non-Outreach	Significance
MC – Medicaid ¹	86	90	p=0.58	88	81	p=0.28
FFS – Medicaid ²	83	79	p=0.58	77	69	p=0.38
All Medicaid	85	85	p=0.99	83	75	p=0.24

¹ MC = Managed Care

² FFS = Fee For Service

Disparities in Immunization Rates:**By Demographic Characteristics:**

Table 14 shows immunization rates by demographic characteristics.

There were no differences in rates by gender, however, there was some variation by race. At 12 months, white children had higher rates than black or Hispanic children, but at 24 months of age these differences did not reach statistical significance, although there was still a trend toward black children to have slightly lower rates.

There were differences by type of primary care provider: pediatric practices had highest rates and neighborhood health centers and family medicine practices had lowest rates. Of note, rates are affected by both patient characteristics as well as provider practices.

According to insurance status, there were no significant differences at 12 months of age, but there were significant differences at 24-months. Among these children, uninsured children and children on fee-for-service Medicaid had lowest rates, while children on Commercial managed care or Child Health Plus had highest rates. Among children covered by Medicaid, there appears to be a difference in immunization rates, with those on Medicaid managed care having higher rates than those on fee-for-service Medicaid.

Summary:

- *Racial disparities in immunization rates are very narrow*
- *Children who were uninsured or had fee-for-service Medicaid had lowest immunization rates*

Table 14 Up-to-Date Rates (Percent) By Demographic Characteristics							
		At 12 Months of Age DTP ₃ /Polio ₂ /Hib ₃ /HepB ₂			At 24 Months of Age DTP ₄ /Polio ₃ /MMR ₁ /Hib [®] _{12m} /HepB ₃		
		%	95% CI	Significance	%	95% CI	Significance
Gender	Female	89.8	85.9 – 92.7	NS	85.0	81.0 – 88.3	NS
	Male	89.3	84.8 – 92.6		84.9	80.3 – 88.6	
Race / Ethnicity	Black – Non-Hispanic	85.6	79.7 – 90.0	p < 0.05	80.3	76.2 – 83.8	NS
	Hispanic	89.0	83.7 – 92.8		86.8	80.0 – 91.5	
	White – Non-Hispanic	93.0	88.4 – 95.8		85.9	77.8 – 91.4	
Type of Primary Health Care Provider	Family Medicine	84.5	76.5 – 90.1	p < 0.01	73.1	62.2 – 81.8	p < 0.01
	Hospital Clinic	85.5	76.6 – 91.4		83.5	81.4 – 85.4	
	Neighborhood HC	78.9	60.7 – 90.0		77.4	73.4 – 80.0	
	Pediatric Practice	93.1	90.0 – 95.3		88.2	82.9 – 92.1	
	Staff Model HMO	78.5	60.5 – 89.7		81.1	81.4 – 88.0	
Insurance	MC – Private (Fully Insured)	91.4	87.9 – 93.9	NS	87.4	82.9 – 90.8	p < 0.01
	FFS – Private (Underinsured)	90.9	81.6 – 95.7		84.3	73.2 – 91.3	
	MC – Medicaid	86.9	81.1 – 91.2		85.7	78.2 – 90.9	
	FFS – Medicaid	82.0	75.6 – 87.1		74.8	67.8 – 80.8	
	Child Health Plus	92.4	78.1 – 97.6		89.5	76.6 – 95.7	
	Uninsured	89.0	73.7 – 95.9		76.1	64.3 – 85.8	

NS: immunization rates are not significantly different among the groups;

P values are by chi-square test among all groups (adjusted for clustered sampling).

Monroe County vs NY State and U.S.:

Table 15 and Figure 22 compare up-to-date rates at 24 months of age for specific individual vaccines and combinations, for the city of Rochester and all of Monroe County, versus New York City, the rest of New York State (NYS), all of NYS, and the U.S. Up-to-date rates from Monroe County are from this survey, and rates for NYS and the U.S. are from the 1999 National Immunization Survey (NIS), which included a birth cohort approximately the same age as the birth cohort in our Monroe County Survey and which also uses provider medical record checks as the gold standard. Rates for 24-month olds are available from the NIS for these vaccines and combinations; rates were not available for other combination schedules such as the DTP4/Polio3/MMR1/Hib($\geq 12m$)/Hep-B3 schedule used as the “gold standard” for Monroe County for 1999 rates.

As shown, up-to-date rates in Monroe County were substantially higher than rates in New York State or national rates. Even when considering the city of Rochester, up-to-date rates were substantially higher than throughout NYS or the U.S.

Summary:

- ***Immunization rates in Monroe County are substantially higher than in New York State or across the US.***
- ***Even rates in the city of Rochester, including the inner city, are higher than rates across NYS or the US.***

Figure 22
Percent of Children Who Are Up-To-Date (UTD) At 24 Months of Age
DTP4/Polio3/MMR1/Hib3/Hep-B3

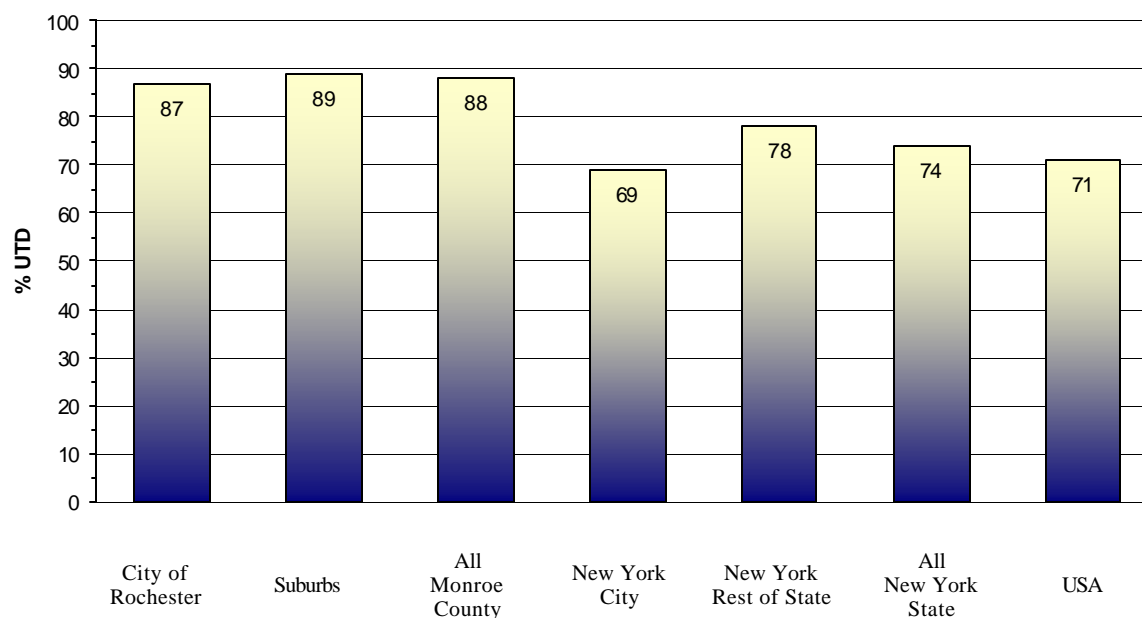


Table 15
Up-to-Date Rates (Percent) - At 24 Months of Age
Monroe County vs. New York State* and USA*

	Rochester	Suburbs	Monroe	New York State			US
				New York City	Rest of State	All of State	
	%	%	%	%	%	%	%
DTP ₄	90.5	94.8	92.8	80.2	87.5	84.1	81.5
Polio ₃	95.5	95.5	95.3	87.2	90.9	89.2	89.3
MMR ₁	95.6	96.6	96.1	93.3	93.9	93.6	90.5
HepB ₃	95.7	95.9	95.8	88.4	95.9	92.3	87.6
DTP ₄ /Polio ₃ /MMR ₁	88.7	92.8	91.2	76.9	81.0	79.0	77.9
DTP ₄ /Polio ₃ /MMR ₁ /Hib ₃ /HepB ₃	86.6	89.1	88.0	68.8	77.8	73.6	71.3

* From the National Immunization Survey, 1999 (children born between 2/96 – 5/98)

Available online at: http://www.cdc.gov/nip/coverage/tables/TAB7-24months_iap.xls

**National Immunization and
Healthy People 2000/2010 Goals:**

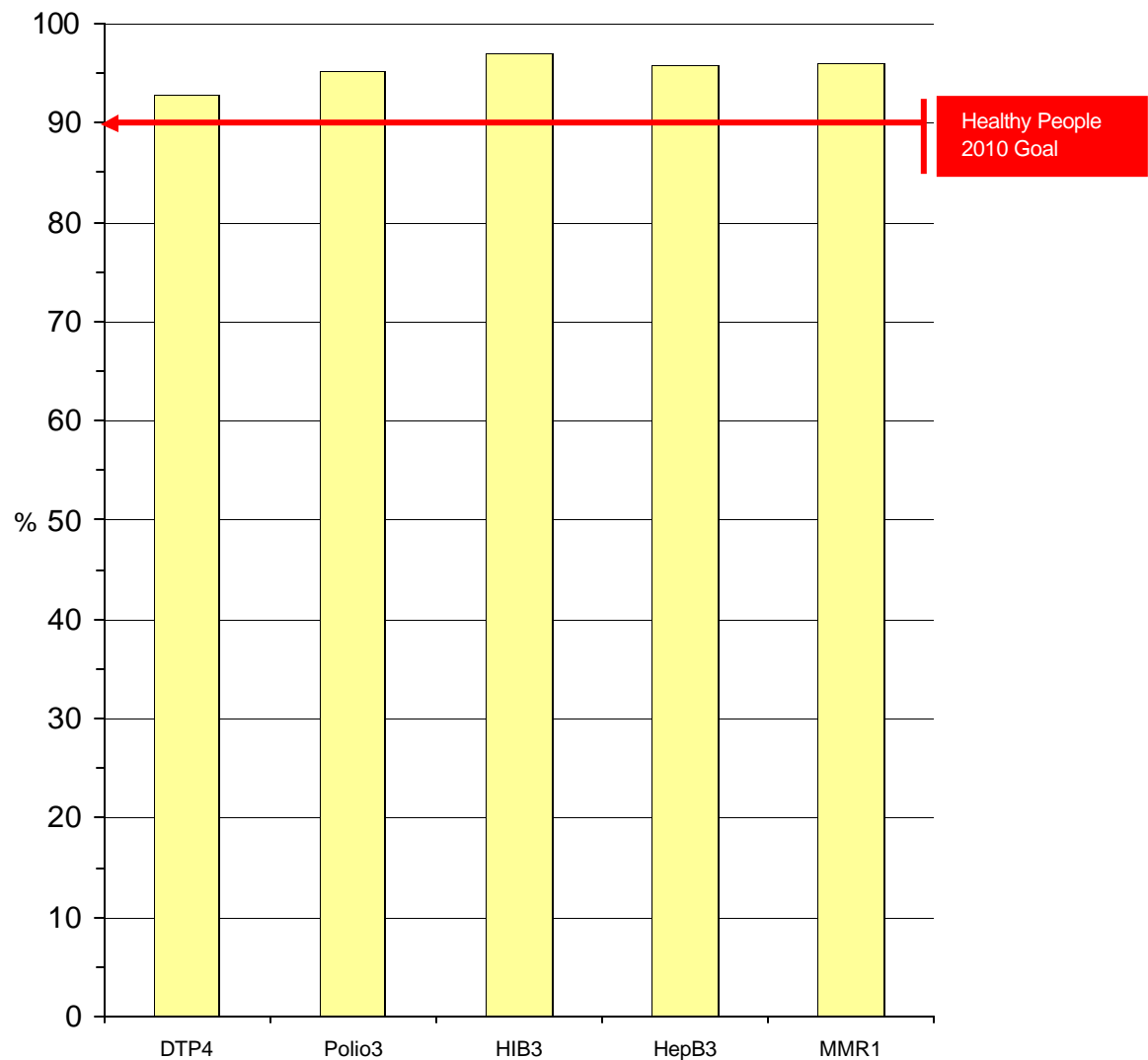
Reductions in childhood vaccine-preventable diseases are among the major public health goals listed in the *Healthy People 2000 and Healthy People 2010* objectives. In order to achieve these goals, the Centers for Disease Control and the U.S. Department of Health and Human Services set a goal of 90% coverage for individual vaccines among children. As the above tables show, Monroe County has exceeded the national goal of 90% coverage rates by 24 months of age for DTP₄, Polio₃, MMR, Hib₃, and Hepatitis B₃.

Although national goals refer to individual immunizations, an obvious long-term goal is to achieve 90% coverage for combination vaccines. Monroe County has not yet achieved this lofty goal.

Summary:

- ***Monroe County has exceeded the national goals of 90% coverage for individual vaccines by 24 months***

**Figure 23
The Difference Between Monroe County's Up-To-Date Rate
And The Healthy People 2010 Vaccination Goals
For Individual Vaccines at 24 Months**



Areas to Target

Although immunization rates throughout Monroe County are quite high, there is room for improvement. Continued efforts are essential to maintain rates in order to ensure protection against vaccine-preventable diseases on a community-wide level.

Specific Populations

▪ Under-vaccinated Children

About 18% of all city of Rochester children, 13% of suburban children, and 15% of all children in Monroe County are not up-to-date for all vaccines at 24 months. Thus, although immunization rates are higher in 1999 than in 1996, in fact, the highest ever recorded, there still remains a group of children who have not yet received all immunizations.

▪ Children Living in the City of Rochester

This survey shows that children who live in the city of Rochester still have slightly lower immunization rates than children who live in the suburbs. Special efforts should continue to be made to raise immunization rates in the city.

▪ Children from Minority Groups

Although racial disparities in immunization rates are very small, they still exist. One goal is to eliminate these disparities entirely.

▪ Children lacking Insurance or on Medicaid

Uninsured children and children who had fee-for-service Medicaid had lowest immunization rates. The primary care outreach program is already targeting these two groups, and facilitated enrollment efforts are underway to help provide health insurance to uninsured children in Monroe County.

Specific Vaccines

▪ DTP Vaccine Booster

The fourth DTP booster has traditionally been problematic, with low coverage. However, between 1996 and 1999, coverage levels for this fourth DTP dose increased 10 percent in the inner city, 4 percent in the suburbs, and 7 percent in all of Monroe County. County wide DTP₄ coverage is now at or above 90% at 24 months of age for the first time ever. Continued careful attention to this booster dose is needed to prevent slippage.

▪ Hib Vaccine Booster

Although probably not statistically significant, there appears to be a leveling off of immunization rates for Hib (*Haemophilus Influenza*) vaccine. There are several different types of Hib vaccines, with different schedules. For example, the Comvax vaccine (Hib/Hepatitis B) requires only 2 vaccines before 12 months of age. All Hib vaccines in the U.S. require a booster after 12 months of age. Some data from the United Kingdom and other countries suggest that 3 Hib doses are protective, even if administered prior to 12 months of age; however the U.S. recommends a dose after 12 months. The chart reviews identified a number of children who had received 3 Hib doses before 12 months of age, who never received a booster Hib vaccination. There may also be some confusion over the different Hib schedules.

▪ New Vaccines

It is important to measure coverage for new vaccinations. For the 1999 Immunization Survey, we measured but did not emphasize rates of varicella immunization because for this birth cohort it was very difficult to determine whether non-immunized children had already been ill with chicken pox. However, varicella rates seemed to be low, as they are nationally. For the next immunization survey, we will measure coverage for varicella and for pneumococcal conjugate vaccine. While Monroe County physicians rapidly adopted Hepatitis B vaccine, adoption of varicella vaccine may be slower. The added burden of additional vaccinations from pneumococcal conjugate vaccine make it important to pay attention to coverage for new vaccines.

Strengths and Limitations

Strengths

The 1999 Monroe County Immunization Survey has several strengths. Most importantly, it represents a truly denominator-based measurement of immunization rates, made possible by the fact that we were able to obtain data from the vast majority of primary care practices to represent 85% of the child population. Parental report of immunization status is notoriously inaccurate; thus the National Immunization Survey, which is based on a random-digit dialing methodology, determines actual immunization rates from review of medical records and not from parent records or parent recall. Our county wide rates are determined in a similar manner, except that we did not rely on parents to point us toward sources of medical charts, but rather reviewed all possible medical charts at all primary care offices.

A second strength is that the sample size is adequate to obtain precise measures of immunization rates for subsets of the population, such as for children living in geographic areas within the county. This allows for interventions that target these subsets of the child population.

A third strength is that the sampling strategy and overall study design followed the techniques used in the 1993 and 1996 surveys, allowing for meaningful comparisons in immunization rates across time. By identifying changes in immunization rates including improvement as well as leveling off of rates, we can better target strategies for interventions.

A fourth strength involves the analytic strategy. Since the sampling involved first stratifying Monroe County into three regions (inner city, rest of the city, and suburbs), and then sampling by practice with a higher proportion of children coming from city practices than from suburban practices, we designated sampling weights for each child, and adjusted the final immunization rates and confidence intervals according to the stratified regional sampling, the clustering by practice (since patients within practices are not independent), and the sample weights depending on practice type. The results provide an accurate estimate of immunization rates for the entire county, as well as for specific subsets of the population.

Limitations

The 1999 Monroe County Immunization Survey has several limitations. First, there is no perfect method to measure immunization rates throughout a large community. In 1993, 1996, and again in 1999, we used a practice-based approach because prior studies have shown that almost all children in this region have a primary care provider. Patients who never were seen in a primary care practice would have been missed by this survey, and their immunization rates might be lower than patients who were ever seen in the practices. However, the number of children who were never seen in the first 2 years of their lives (by any practice in Monroe County) is extremely small, and probably represents children who actually moved into or out of Monroe County. Support for this point lies in the finding that the Monroe County population estimate from the survey (as measured by children who have been to any county practice) is similar to the expected population size of all children in the county, regardless of whether they have ever seen a doctor. We believe this limitation is small.

A second limitation is that not all practices participated. 64 practices (74% of all practices, representing 85% of all children) participated in the survey. Thus, about 15% of children in Monroe County were not included in this survey. To the extent that immunization rates of these children were different from immunization rates of the rest of the population, the immunization survey results might be somewhat inaccurate. Fortunately, the proportion of non-participants was relatively small. Reasons for non-participation by practices varied, and often included administrative issues such as recent renovations, new locations, and medical record changes. All 3 neighborhood health centers, all 4 hospital-based clinics/practices, and all 4 staff-model HMO practices participated; thus representation of children living in the city of Rochester was higher than of the suburbs. A higher proportion of practices that failed to participate were in the suburbs. Since we found extremely little variability in immunization rates across the suburbs, it is likely that the true immunization rates are not much different because of non-participation by some suburban children. Finally, a higher proportion of pediatric practices participated than family medicine practices (76% versus 60%); however many of the family medicine practices that failed to participate served small numbers of

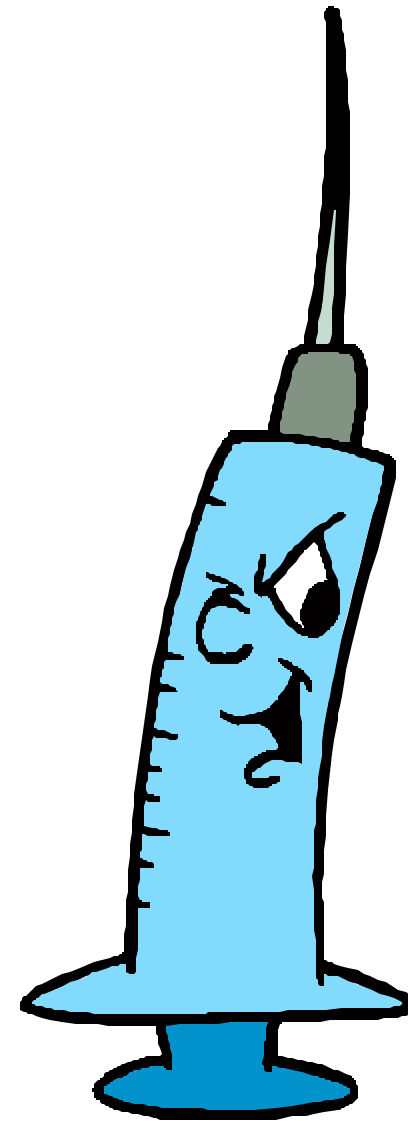
children. Appropriate weighting was used in calculation of county-side rates, to account for practice non-participation.

Immunization rates were measured by medical chart review. We did not interview parents to determine all prior sites of immunizations. It is possible that some patients received immunizations from practices not included in this study (either practices that refused to participate or practices outside Monroe County). Thus it is possible that these reported immunization rates represent an underestimate of true immunization coverage for this population. This is particularly true for Hepatitis B. We did not review hospital medical charts to determine whether Hepatitis B was administered to newborns in the hospital, prior to discharge. While most of these immunizations administered in the hospital would have been recorded in primary care records, some might have been missed. Also, as a standard of care in all hospitals, Hepatitis B is not routinely given unless the primary care physician specifically requests it; therefore it is unlikely that many doses were missed by the primary care chart reviews. Errors in chart reviews were minimized by (a) quality assurance checks, and (b) re-review of all medical charts (at all relevant practices) for children noted to be behind on the initial chart review.

Recent studies have noted that parent recall is far less accurate than chart reviews at primary care provider offices to determine exact dates of immunizations. Parental recall is helpful to identify sources of care; in fact the National Immunization Survey (NIS), which uses a random digit dialing method to interview parents of toddlers to determine national immunization rates, obtains only sources of care from parents, and then uses chart reviews to determine actual immunization dates. In Monroe County, this was not needed because we reviewed charts at most primary care practices and combined records for duplicates and for patient use of multiple practices

Finally, immunization rates represent population-wide estimates derived from the sample. These population estimates are thus subject to sampling error and limitations due to sample size. Several tables include 95% confidence intervals for both individual and combination. Because the sample sizes were large, these confidence intervals tend to be relatively narrow-- ± 3 to 5%. Confidence intervals for immunization rates for specific geographic regions or subsets of the population are wider.

Each of these limitations might lead to either an overestimate or an underestimate of Monroe County's immunization rates. While we believe the ultimate impact of these limitations is small, it is important to keep them in mind when interpreting the population immunization rates.



Conclusions

1. Immunization rates rose substantially from 1993 to 1996, and again from 1996 to 1999. Since 1996, up-to-date rates increased from 82% to 90% at 12 months, and from 75% to 85% at 24 months.
2. Immunization rates in 1999 are very high throughout Monroe County. Coverage for combination of vaccines is very high: at 24 months immunization rates are 83% in the inner city, 82% for the entire city of Rochester, 87% in the suburbs, and 85% for the county.
3. Coverage for individual vaccines is higher than 90% at 12 and 24 months of age, including coverage for Hepatitis B.
4. The disparity in immunization rates between the inner city and suburbs was reduced from 18% in 1993 to 4-5% in 1999.
5. Disparities in immunization rates by race or ethnicity have virtually been eliminated, with only slightly lower rates at 12 months for black children.
6. Uninsured children, and children covered by fee-for-service Medicaid had the lowest immunization rates in Monroe County.
7. Except for the city-suburb differences, there were no major differences in immunization rates across geographic regions (e.g., across quadrants of the city, or across suburban regions). Special emphasis on geographic regions (except for the city of Rochester) is not warranted.
8. 15-20 percent of the children in Monroe County have still not received all their immunizations by 24 months of age. Thus more work needs to be done to ensure timely immunization of all children by 2 years.
9. Immunization rates in Monroe County are substantially higher than New York State, and much higher than national rates. Monroe County has far exceeded national goals with respect to childhood immunizations.

1.

UTD At 12 And 24 Months of Age				
Age	Vaccine Combination	93	96	99
12 months	DTP ₃ /Polio ₂ /HIB ₃	81%	90%	91%
	DTP ₃ /Polio ₂ /HIB ₃ /HepB _{2xx}	--	82%	90%
24 months	DTP ₄ /Polio ₃ /MMR ₁ /HIB _{≥12m}	66%	81%	87%
	DTP ₄ /Polio ₃ /MMR ₁ /HIB _{≥12m} /HepB ₃	--	81%	85%

2.

UTD At 12 And 24 Months of Age				
	Inner City	City of Rochester	Suburbs	Monroe County
12 Months	87%	87%	92%	91%
24 Months	83%	82%	87%	85%

3.

UTD At 12 And 24 Months of Age				
	Inner City	City of Rochester	Suburbs	Monroe County
12 Months	>87%	>89%	92%	91%
24 Months	>90%	>90%	90%	90%

4.

UTD At 24 Months of Age			
	93	96	99
Inner City	55%	75%	83%
Suburbs	73%	85%	87%
Difference	18%	10%	4%

5.

UTD At 24 Months of Age			
	Black	White	Hispanic
	80%	86%	87%

6.

UTD At 24 Months of Age			
	Medicaid FFS	Medicaid MC	Private MC
Uninsured	76%	86%	87%

7.

UTD At 24 Months of Age	
City of Rochester	Suburbs
82%	87%

8.

Underimmunized 2-Year Old Children
~ 1,500

9.

UTD At 24 Months of Age						
City of Rochester	Suburbs	Monroe County	NY City	Rest Of NYS	All NYS	USA
87%	89%	88%	69%	78%	74%	71%

Implications

There are several implications from the 1999 immunization survey:

1. High immunization rates represent an important marker for high-quality preventive care throughout our county. Studies have found that immunizations are highly correlated with other measures of preventive care; thus, high immunization rates likely reflect high levels of preventive care.
2. Vaccine-preventable diseases will be relatively rare in Monroe County because immunization rates are so high. In particular, just as *Hemophilus influenzae* has virtually disappeared here, Hepatitis B will also gradually disappear in this cohort. With measles vaccination rates above 90%, an outbreak among children in the county is not likely. Of course, vaccines are not 100% effective and frequently require booster doses; thus sporadic episodes of vaccine-preventable diseases including pertussis and *Hemophilus influenzae* disease will still occur.

The relatively high rates of Hepatitis B coverage suggest that the primary care practitioners in this community have accepted and are adhering to the new recommendations for universal infant vaccination with Hepatitis B vaccine. This is an important finding because the addition of Hepatitis B vaccine to the list of recommended vaccinations initially led to some controversy, in part because of concern about the increased number of injections required by the new schedule. A similar discussion is now occurring with respect to the varicella vaccination and the newly licensed conjugate pneumococcal vaccine. The high coverage rate for Hepatitis B within a few of years of universal recommendation suggests that these other new universal vaccinations will be rapidly incorporated here in Monroe County.

3. At 24 months of age, up-to-date rates were not markedly different for combination vaccines according to race of children, a truly remarkable achievement in eliminating racial disparities in health care. One group of children who had the lowest immunization rates were uninsured children, and strategies are needed to provide all children in Monroe County with adequate health insurance.

Figure 24
Implications for Monroe County

1. High rates are a key marker for high quality of preventive care
 2. If current rates are maintained, vaccine-preventable diseases will be rare
 3. We need strategies to provide uninsured children (who have the lowest immunization rates), with insurance.
 4. Disparities between the city and suburbs have narrowed, and can soon be eliminated
 5. We must focus on improving preventive care for the 12-20% of children who remain underimmunized
4. Disparities in immunization rates between the city and suburbs can be *totally eliminated* in Monroe County. Reduction of disparities across populations has become a major national health goal, and we are within sight of such an achievement for childhood immunization rates. Continued special efforts targeting the inner city are required to maintain important gains and to continue to narrow the gap in immunization rates between the city and suburbs.

Immunization rates in the city of Rochester are now only 4 percent lower than in the suburbs – a dramatic improvement since 1993. Several interventions targeting the inner city population may have lead to these improvements. The three major interventions are:

- An increase in awareness and emphasis on immunizations
- Changes in insurance laws and introduction of the Vaccines For Children Program
- The immunization outreach program

The present Monroe County 1999 immunization survey was conducted at a time when the outreach workers were serving approximately 70% of children living in the city of Rochester. Since inner-city children are generally poor, and often have other medical or psychosocial problems, special efforts should continue to be made to provide immunizations to this population. Withdrawing or reducing services at this time might cause a return to the low immunization levels noted in the inner city population in 1993.

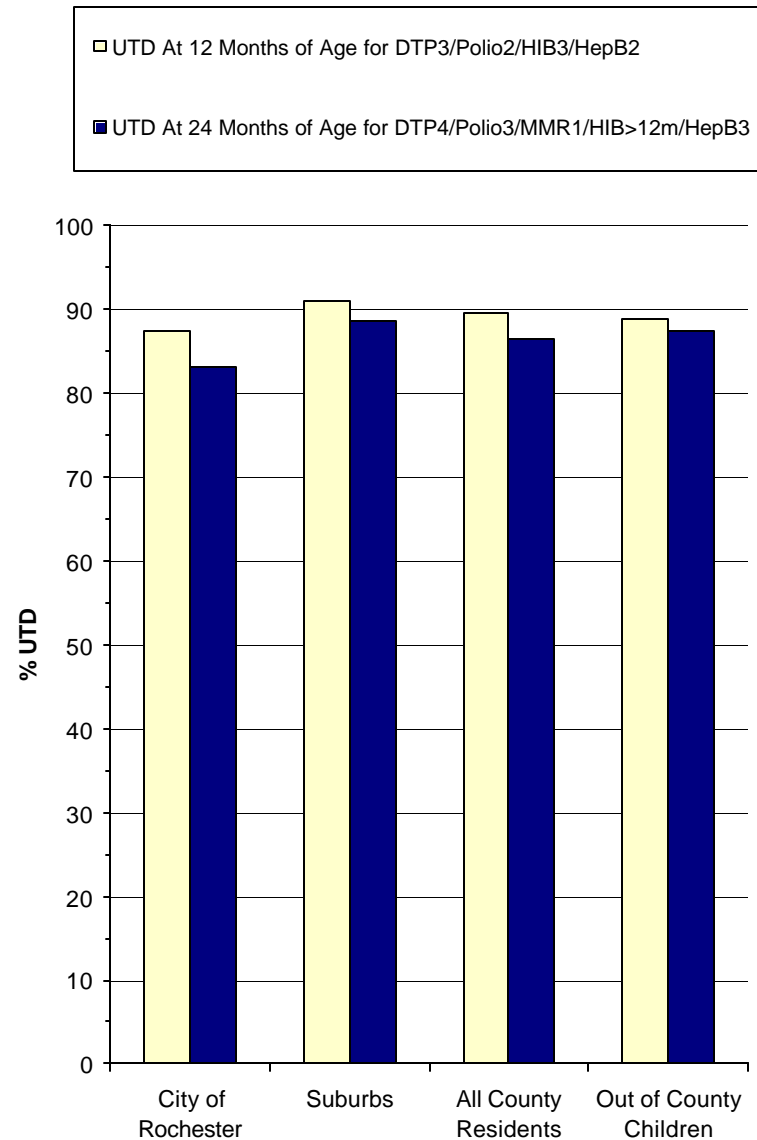
5. Finally, the Monroe County 1999 Immunization Survey reveals that 10 to 12% of 1-year olds and 15 to 20% of 2-year old children throughout Monroe County still lack at least one vaccination. Many of these children require only one vaccination to become up-to-date. Several strategies have been noted to improve immunization rates. These include:

- patient reminder/recall systems,
- standing orders for immunizations to reduce missed opportunities,
- regular assessments of immunization rates of primary care practices, with quality-improvement strategies designed to improve rates, and
- incentives within practices, and for practices, to improve rates.

One of the major requirements of a population-based immunization strategy is to be able to identify children who are behind, and to act on that information. Perhaps the greatest benefit of a centralized immunization registry is to identify underimmunized children in a timely manner, and to assist the primary care providers in tracking, reminder, recall, and outreach efforts. Since the majority of children are now up-to-date in immunizations, the major new efforts should concentrate on these remaining children. By linking a tracking system with expanded comprehensive preventive care and continued outreach to at-risk children, we can substantially improve the quality of child health care in Monroe County.

Childhood immunizations has been heralded as one of mankind's major success stories. The high immunization rates, the reduction in disparities in immunization rates, and the continued efforts to immunize every child on time represent a major public health achievement for Monroe County.

Figure 25
Up-To-Date Rates (UTD) by Geographic Region
For Combinations of Vaccines at 12 and 24 Months



Appendices

- Appendix 1: List of Primary Care Practices
- Appendix 2: Fieldwork Protocol
- Appendix 3: Map of Monroe County and Rochester Quadrants
- Appendix 4: Demographic Characteristics by Region
- Appendix 5: Immunization Rates for Other Geographic Regions
- Appendix 6: Comparison of Rates (1993/1996/1999) for Other Geographic Regions

1999 MONROE COUNTY IMMUNIZATION SURVEY – Appendix 1: List of Primary Care Practices

Practice	Provider(s)	Details
A Place For Healing 120 Allen Creek Road Rochester, NY 14618 (716) 256-3260	Mary Claire H. Weiss, M.D.	Suburban Practice Family Practice Participant Manual Pt List Est Cohort: 13
Anthony L Jordan Health Ctr. 82 Holland Street Rochester, NY 14605 Phone: (716) 423-5820	Robert S. Chavkin, M.D. Mojtaba M. Dini, M.D. Savita Puri, M.D.	City Practice NHC Participant Electronic Pt List Est Cohort: 304
Associates in Family Practice 2260 Lake Avenue Suite 1000 Rochester, NY 14612 Phone: (716) 254-1850	Margaret L. Donahue, M.D. Gaylin Greenwood, M.D. Richard Kennedy, M.D. Vito P. Laglia, M.D. Michael Nazar, M.D.	City Practice Family Practice Participant Printed Pt List Est Cohort: 59
Bay Creek Medical Group 2000 Empire Boulevard Suite 200 Webster, NY 14580 Phone: (716) 787-1250	Harold A. Kanthor, M.D. Susan S. MacLean, M.D.	Suburban Practice Pediatrics Participant Printed Pt List Est Cohort: 264
Brandon, Hirsch, & Klossner, M.D.'s 710 Crosskeys Office Park Fairport, NY 14450 This Office Is Now Closed Phone: (716) 425-1466	Robert J. Brandon, M.D. Michael G. Hirsh, M.D. Kevin Edward Klossner, M.D.	Suburban Practice Pediatrics Participant Manual Pt List Est Cohort: 46
Brighton Family Health 2210 Monroe Ave Rochester, NY 14618 Phone: (716) 473-6970	Joseph C. Mancini, M.D. Bernard Plansky, M.D.	Suburban Practice Family Practice Non-Participant Est Cohort: 10
Brighton Family Medicine 560 White Spruce Blvd Rochester, NY 14623 Phone: (716) 292-6440	Laura Jo Booth, M.D. Christine Borghi-Cavallaro, M.D.	Suburban Practice Family Practice Participant Manual Pt List Est Cohort: 31
Cenie C. Cafarelli, M.D. 2275 South Clinton Avenue Rochester, NY 14618 Phone: (716) 244-5452	Cenie Clelia Cafarelli, M.D.	Suburban Practice Pediatrics Participant Printed Pt List Est Cohort: 23

Practice	Provider(s)	Details
Calkins Health Commons - Pediatrics 125 Red Creek Drive Rochester, NY 14623 Phone: (716) 922-9001	Farideh Aziz, M.D. Kevin E. Klossner, M.D. Kim R. Wentz, M.D.	Suburban Practice Pediatrics Non-Participant Est Cohort: 32
Chamberlain, Mikus, & Sullivan, M.D.'s 3101 West Ridge Road Building C Rochester, NY 14626 Phone: (716) 225-1700	John K. Chamberlain, M.D. Paul M. Mikus, M.D. Richard P. Sullivan, M.D.	Suburban Practice Pediatrics Participant Printed Pt List Est Cohort: 32
Chili Center Family Medicine 3173 Chili Ave Bldg 400 Rochester, NY 14624 Phone: (716) 247-3770	John T. Bank, M.D. Maria Mastrosimone, M.D. William D. Pum, M.D.	Suburban Practice Family Practice Participant Electronic Pt List Est Cohort: 22
Chili Medical Group 4201 Buffalo Road North Chili, NY 14514 Phone: (716) 594-4484	Joanne L. Beaubien, M.D. Scott Stratton-Smith, M.D.	Suburban Practice Family Practice Participant Electronic Pt List Est Cohort: 20
Dalberth & Masood, M.D.'s 1295 Portland Avenue Suite 17 Rochester, NY 14621 Phone: (716) 467-5957	Salvatore Dalberth, M.D. S Siraj Masood, M.D.	City Practice Pediatrics Participant Printed Pt List Est Cohort: 90
Downtown Health Care Center 228 East Main Street First Floor Rochester, NY 14604 Phone: (716) 423-1880	Joanne L. Beaubien, M.D. Lisa Harris, M.D. Vivienne Taylor, M.D.	City Practice Pediatrics Non-Participant Est Cohort: 4
Baruch Eisenberg, M.D. 1946 South Clinton Avenue Rochester, NY 14618 Phone: (716) 461-0720	Baruch Eisenberg, M.D.	Suburban Practice Pediatrics Non-Participant Est Cohort: 70
Elmwood Pediatric Group 125 Lattimore Road Rochester, NY 14620 Phone: (716) 244-9720	Janet R. Casey, M.D. Carolyn Cleary, M.D. Ann L. Failing, M.D. Anne B. Francis, M.D. John L. Green, M.D. William J. Hoeger, M.D. Alice Loveys, M.D. Steven M. Marsocci, M.D. Michael E. Pichichero, M.D.	City Practice Pediatrics Participant Electronic Pt List Est Cohort: 442

Practice	Provider(s)	Details
Elmwood Pediatrics 1000 Pittsford-Victor Road Pittsford, NY 14534 Phone: (716) 381-3780	Janet R. Casey, M.D. Carolyn Cleary, M.D. Ann L. Failing, M.D. Anne B. Francis, M.D. John L. Green, M.D. William J. Hoeger, M.D. Alice Loveys, M.D. Steven M. Marsocci, M.D. Michael E. Pichichero, M.D.	Suburban Practice Pediatrics Participant Electronic Pt List Est Cohort: 202
English Road Family Physicians 1800 English Road Rochester, NY 14616 Phone: (716) 227-1820	Thomas Arnone, M.D. Arnold Campo, M.D. Diane W. Piela, M.D.	Suburban Practice Family Practice Participant Electronic Pt List Est Cohort: 11
Evergreen Family Medicine 4079 Lake Road Brockport, NY 14420 Phone: (716) 637-0151	David M. Newman, M.D.	Suburban Practice Family Practice Participant Electronic Pt List Est Cohort: 11
Fairport Pediatrics 460 Cross Keys Office Park Fairport, NY 14450 Phone: (716) 223-6111	Michael H. Anthony, M.D. Richard A. Bloom, M.D. Jeffrey C. Eisenberg, M.D. Jack W. Finnell, M.D. Bogdan Mscichowski, M.D. Saul K. Sokolow, M.D.	Suburban Practice Pediatrics Participant Printed Pt List Est Cohort: 444
Family Medicine Center 885 South Avenue Rochester, NY 14620 Phone: (716) 442-7470	Richard Botelho, M.D. Sarah E. Bronsky, M.D. Andrew Call, M.D. Thomas Campbell, M.D. John Dickinson, M.D. Steven Eisinger, M.D. Ronald Epstein, M.D. Peter Franks, M.D. Leila A. Kirdani-Ryan, M.D. Suzanne Lee, M.D. Lawrence M. Leeman, M.D. Deborah Pierce, M.D. Naomi Pless, M.D. Eric Schaff, M.D. Douglas Stockman, M.D.	City Practice Family Practice Participant Electronic Pt List Est Cohort: 246

Practice	Provider(s)	Details
Family Medicine of Webster Phone: (716) 787-7470	Gregory J. Ryan, M.D. Drew Werner, M.D.	Suburban Family Practice Non-Participant Est Cohort: 86
Foster Care Clinic 111 Westfall Road Rochester, NY 14620 Phone: (716) 274-6407	Jacobs-Perkins, M.D. Moirra Ann Szilagyi, M.D.	City Practice Pediatrics Participant Electronic Pt List Est Cohort: 58
Howard R. Foye, M.D. 2235 South Clinton Avenue Rochester, NY 14618 Phone: (716) 271-0930	Howard Ryder Foye, M.D.	Suburban Practice Pediatrics Participant Printed Pt List Est Cohort: 55
Sonia Garcia, M.D. 1401 Stone Road, Suite 304 Rochester, NY 14615 Phone: (716) 621-2120	Sonia Garcia, M.D.	Suburban Practice Pediatrics Participant Manual Pt List Est Cohort: 40
Gates Family Medicine 2735 Buffalo Road Suite 2 Rochester, NY 14624 (716) 426-1290	Michael Foster, M.D.	Suburban Practice Family Practice Non-Participant Est Cohort: 22

1999 MONROE COUNTY IMMUNIZATION SURVEY – Appendix 1: List of Primary Care Practices

Practice	Provider(s)	Details
Genesee Health Service 222 Alexander Street Rochester, NY 14607 (716) 263-5678	Maria-Elena Banghart, M.D. Melissa L. Beisheim, M.D. David N. Broadbent, M.D. David Kotok, M.D. Richard A. Lawrence, M.D. Albert Mangold, M.D. C Mohini Mehra, M.D. Max W. Steiner, M.D.	City Practice Hospital Clinic Participant Electronic Pt List Est Cohort: 734
Genesee Medical Assoc. – Webster 40 Barrett Drive Webster, NY 14580 This Office Is Now Closed (716) 872-4450	Frank B. Magill, M.D. Patrice Thibodeau, M.D.	Suburban Practice Pediatrics Non-Participant Est Cohort: 396
Genesis Pediatrics 1850 Buffalo Road Suite 200 Rochester, NY 14624 (716) 426-4100	Catherine A. Goodfellow, M.D. H Holly Kim, M.D.	Suburban Practice Pediatrics Participant Printed Pt List Est Cohort: 245
Goodman Pediatrics 26 South Goodman Street Rochester, NY 14607 (716) 473-7028	George Decancq, M.D. Barbara D. Dooley, M.D. Susan G. Miller, M.D. Charles I. Olin, M.D. Karen S. Parsons, M.D. Shellie K. Sasscer, M.D.	City Practice Pediatrics Participant Electronic Pt List Est Cohort: 163
Greece Pediatrics PC 888 Long Pond Road Rochester, NY 14626 (716) 225-5030	Ramnik R. Vora, M.D.	Suburban Practice Pediatrics Participant Manual Pt List Est Cohort: 39
Marcy Hartle, M.D. 3629 East River Road West Henrietta, NY 14586 (716) 292-6893	Marcy Hartle, M.D.	Suburban Practice Pediatrics Non-Participant Est Cohort: 68
Hilton Health Care 279 East Avenue Hilton, NY 14468 (716) 392-9100	Robert E. Blackburn, M.D. Eric A. Cederstrom, M.D. Mark Sarnov, M.D. Benson L. Zoghlin, M.D. Leon N. Zoghlin, M.D.	Suburban Practice Family Practice Participant Printed Pt List Est Cohort: 31

Practice	Provider(s)	Details
Honeoye Valley Family Practice 23 Ontario Street Honeoye Falls, NY 14472 (716) 624-2121	Sheryl M. Ehrmentraut, M.D. Nadette B. Jacob, M.D. David A. Ness, M.D. Mary Kay Ness, M.D. Jules A. Zysman, M.D.	Suburban Practice Family Practice Participant Printed Pt List Est Cohort: 59
Irondequoit Pediatrics 564 East Ridge Road, Suite 204B Rochester, NY 14621 (716) 266-0310	Andrew Holt, M.D. Mary L. Khunger, M.D.	Suburban Practice Pediatrics Participant Electronic Pt List Est Cohort: 158
Jefferson Family Medicine 924 Jefferson Ave Rochester, NY 14611 (716) 463-3870	William H. Bayer, M.D.	City Practice Family Practice Participant Electronic Pt List Est Cohort: 47
Lester Katzel, M.D. 444 White Spruce Boulevard Rochester, NY 14623 (716) 424-6500	Lester Katzel, M.D. Joseph B. Kilimnick, M.D.	Suburban Practice Pediatrics Participant Printed Pt List Est Cohort: 63
Edward Lewis, M.D. 880 Westfall Road, Suite E Rochester, NY 14618 (716) 442-1421	Edward Lewis, M.D.	Suburban Practice Pediatrics Participant Printed Pt List Est Cohort: 64
Lifetime Health - Folsom Health Ctr. 1850 Brighton Henrietta Town Line Rd Rochester, NY 14623 (716) 424-6210	Timothy G. Malia, M.D. Stanley F. Novak, M.D. Ed Sassaman, M.D. Carolyn R. Stern, M.D.	Suburban Practice Staff HMO Participant Printed Pt List Est Cohort: 91
Lifetime Health - Greece Health Ctr 470 Long Pond Road Rochester, NY 14626 (716) 227-7600	Timothy Hessert, M.D.	Suburban Practice Staff HMO Participant Printed Pt List Est Cohort: 82

1999 MONROE COUNTY IMMUNIZATION SURVEY – Appendix 1: List of Primary Care Practices

Practice	Provider(s)	Details
Lifetime Health - Perinton Health Ctr. 77 Sully's Trail Pittsford, NY 14534 (716) 248-5300	Mark Cohen, M.D.	Suburban Practice Staff HMO Participant Printed Pt List Est Cohort: 30
Lifetime Health - Westfall Pediatrics 2561 Lac De Ville Blvd Rochester, NY 14618 (716) 473-3900	Timothy G. Geen, M.D. Stephanie L. Page, M.D. David M. Perricone, M.D.	Suburban Practice Pediatrics Participant Printed Pt List Est Cohort: 208
Lifetime Health - Wilson Health Ctr. 800 Carter Street Rochester, NY 14621 (716) 338-1400	Ruvim D. Falkovich, M.D. Pradip R. Kadakia, M.D. Shireen M. Khaled, M.D. Stanley F. Novak, M.D.	City Practice Staff HMO Participant Printed Pt List Est Cohort: 207
Long Pond Pediatrics 2350 Ridgeway Ave Suite B Rochester, NY 14626 (716) 225-0950	Charles L. Bruehl, M.D. Maryanne C. Kiernan, M.D. Sarah E. Leddy, M.D. Elizabeth S. O' Brien, M.D. Diana R. Williams, M.D.	Suburban Practice Pediatrics Participant Electronic Pt List Est Cohort: 346
Mendon Pediatrics 30 Assembly Drive, Suite 105 P.O. Box 488 Mendon, NY 14506 (716) 624-4520	H George Decancq, M.D. Donna Meyer, M.D. Charles I. Olin, M.D. Karen S. Parsons, M.D.	Suburban Practice Pediatrics Participant Electronic Pt List Est Cohort: 50
North Chili Pediatrics 7 College Greene Drive North Chili, NY 14514 (716) 594-1800	Monica Henoch, M.D. Amy Taylor, M.D.	Suburban Practice Pediatrics Non-Participant Est Cohort: 150
North Clinton Family Medicine 309 Upper Falls Blvd Rochester, NY 14605 (716) 266-6660	Elizabeth Romero, M.D.	City Practice Family Practice Non-Participant Est Cohort: 61

Practice	Provider(s)	Details
North Rochester Family Medicine 240 East Ridge Road Rochester, NY 14621 (716) 266-2840	Jeanne C. Beddoe, M.D. Diana Herrmann, M.D. Elizabeth H. Naumburg, M.D. Brian Steele, M.D.	City Practice Family Practice Non-Participant Est Cohort: 46
Northeast Medical Group 905 Culver Road Rochester, NY 14609 This Office Is Now Closed (716) 482-4300	Julia Stein, M.D. Odet E. Youssef Elfar, M.D.	City Practice Pediatrics Participant Electronic Pt List Est Cohort: 225
Oak Orchard Community Health Ctr. 300 West Avenue Brockport, NY 14420 (716) 637-3905	Vinay Aggarwal, M.D. Alfred J. Daniels, M.D. Sonia M. Diaz, M.D. Colleen T. Fogarty, M.D. James P. Goetz, M.D.	Suburban Practice Family Practice Participant Electronic Pt List Est Cohort: 141
Ogden Family Health Center 42 Nichols Street #1 Spencerport, NY 14599 (716) 352-0878	Paul R. Di Egidio, M.D.	Suburban Practice Family Practice Non-Participant Est Cohort: 14
Panorama Pediatric Group 220 Linden Oaks, Suite 200 Rochester, NY 14625 (716) 381-4700	Lisa L. Colton, M.D. Emma Hughes, M.D. Suzanne W. Klein, M.D. Laura J. Kopp, M.D. Thomas K. McNerny, M.D. Lawrence Nazarian, M.D. John M. Seaman, M.D. Laura Jean Shipley, M.D.	Suburban Practice Pediatrics Participant Electronic Pt List Est Cohort: 587
Parkview Pediatrics 1050 Pittsford Victor Road Pittsford, NY 14534 (716) 383-1160	Jeffrey Craig Levinn, M.D.	Suburban Practice Pediatrics Participant Electronic Pt List Est Cohort: 130
Parkway Family Medicine 500 Island Cottage Road Rochester, NY 14612 (716) 368-6000	Janine J. Daly, M.D. Joseph C. Finetti, M.D. Rebecca Gargan, M.D. Clifford J. Hurley, M.D. Maria G. Mastrosimone, M.D. Richard F. Mittereder, M.D. Mark Reifenshtein, M.D.	Suburban Practice Family Practice Participant Electronic Pt List Est Cohort: 14

1999 MONROE COUNTY IMMUNIZATION SURVEY – Appendix 1: List of Primary Care Practices

Practice	Provider(s)	Details
Parkway Pediatrics 500 Island Cottage Road Rochester, NY 14612 (716) 225-2610	Cheryl A. Kame, M.D. Gretchen C. Smith-Burke, M.D. Benedetto B. Vitullo, M.D.	Suburban Practice Pediatrics Non-Participant Est Cohort: 294
Pediatric Practice at Children's Hosp. 601 Elmwood Avenue, Box 632 Rochester, NY 14642 (716) 275-2821	Neil E. Herendeen, M.D. Jacobs-Perkins, M.D. Jeffrey Kaczorowski, M.D. Gregory S. Liptak, M.D. Kenneth McConnochie, M.D. Stanley J. Schaffer, M.D. Peter G. Szilagyi, M.D.	City Practice Hospital Clinic Participant Electronic Pt List Est Cohort: 656
Pen Fair Pediatric Group 401 Penbrooke Dr, Bldg 3 Penfield, NY 14526 (716) 377-0810	Kerry Katlic, M.D. Michael G. Martin, M.D.	Suburban Practice Pediatrics Participant Electronic Pt List Est Cohort: 70
Penfield Pediatrics 2067 Fairport Nine Mile Point Road Parkside Commons Plaza Penfield, NY 14526 (716) 377-0840	Barbara Heintz, M.D. Elliot Kaplan, M.D. Margot Weinberg, M.D.	Suburban Practice Pediatrics Participant Electronic Pt List Est Cohort: 166
Perinton Pediatrics 490 Perinton Hills Office Park Fairport, NY 14450 (716) 223-8653	Julie M. Lenhard, M.D.	Suburban Practice Pediatrics Participant Electronic Pt List Est Cohort: 56
Pittsford Pediatric Associates 59 Monroe Avenue, Suite B Pittsford, NY 14534 (716) 385-1710	Bernard Gross, M.D. Cathy J. Hahn, M.D. Matteo J. Lopreiato, M.D. Alice A. Loveys, M.D. Rahul Sengupta, M.D.	Suburban Practice Pediatrics Participant Manual Pt List Est Cohort: 314
Portland Pediatric Group 1400 Portland Avenue Rochester, NY 14621 (716) 342-5665	John R. Bosco, M.D. Roderick G. Davis, M.D. Michael J. Holmes, M.D.	Suburban Practice Pediatrics Non-Participant Est Cohort: 100

Practice	Provider(s)	Details
Rainbow Pediatrics 1815 South Clinton Avenue #450 Rochester, NY 14618 (716) 244-5210	Lesley Z. Glowinsky, M.D. Kenneth R. Katz, M.D. Elizabeth L. Supra, M.D.	Suburban Practice Pediatrics Participant Printed Pt List Est Cohort: 191
RGH – Pediatric Associates 1425 Portland Avenue Rochester, NY 14621 (716) 338-2575	C Andrew Aligne, M.D. Carmelita Britton, M.D. James Campbell, M.D. Cynthia Christy, M.D. Larry D. Denk, M.D. Lynn Garfunkel, M.D. M Ellen Gellerstedt, M.D. Carol Kavanagh, M.D. Paul F. Lehoullier, M.D. Sheryl A. Ryan, M.D. David M. Siegel, M.D. Kathleen A. Tighe, M.D. Michael Weitzman, M.D.	City Practice Hospital Clinic Participant Electronic Pt List Est Cohort: 529
Rush Family Medicine 15 High Tech Drive Rush, NY 14543 (716) 334-0130	Kathleen M. Donahue, M.D. Charles D. Maskiell, M.D.	Suburban Practice Family Practice Non-Participant Est Cohort: 30
Sahukar, M.D. Lakeside Memorial Hospital 156 West Avenue, Suite 107 Brockport, NY 14420 (716) 637-7250	Satya P. Sahukar, M.D.	Suburban Practice Pediatrics Participant Electronic Pt List Est Cohort: 55
James M. Sando, M.D. 1742 East Ridge Road Ridgeplex Commons Rochester, NY 14622 (716) 544-2880	James M. Sando, M.D.	Suburban Practice Pediatrics Non-Participant Est Cohort: 79
David B. Shuttleworth, M.D. 2235 South Clinton Avenue Rochester, NY 14618 (716) 271-2465	David B. Shuttleworth, M.D.	Suburban Practice Pediatrics Participant Printed Pt List Est Cohort: 35
David Smith, M.D. Lakeside Memorial 1 56 West Avenue Office B Brockport, NY 14420 (716) 637-2529	David Irwin Smith, M.D.	Suburban Practice Pediatrics Participant Electronic Pt List Est Cohort: 52

1999 MONROE COUNTY IMMUNIZATION SURVEY – Appendix 1: List of Primary Care Practices

Practice	Provider(s)	Details
Anthony C. Sorge, M.D. 14 Pleasant Street Fairport, NY 14450 (716) 425-1153	Anthony C. Sorge, M.D.	Suburban Practice Pediatrics Non-Participant Est Cohort: 56
Soule & Schwartzberg, M.D.'s 16 North Goodman Street Rochester, NY 14607 (716) 271-2937	Stanley Schwartzberg, M.D. David Weaver Soule, M.D.	City Practice Pediatrics Non-Participant Est Cohort: 98
Spencerport Family Medicine 377 South Union Street Spencerport, NY 14559 (716) 352-8999	Melanie R. Conolly, M.D. Elizabeth Feltner, M.D. Linda Lee, M.D. Michael Mazza, M.D. Patrick J. McGrath, M.D.	Suburban Practice Family Practice Participant Electronic Pt List Est Cohort: 43
Laurence Sugarman, M.D. 2233 Clinton Ave., S Rochester, NY 14618 (716) 271-0860	Laurence Sugarman, M.D.	Suburban Practice Pediatrics Participant Printed Pt List Est Cohort: 54
The Chapel Guidance Center 340 Arnett Boulevard Rochester, NY 14619 (716) 235-2250	Michael P. McMullen, M.D. William R. Morehouse, M.D. T Eric Schackow, M.D.	City Practice Family Practice Participant Printed Pt List Est Cohort: 25
Thurston Road Family Medicine 360 Thurston Road Rochester, NY 14619 (716) 328-1154	Karen Gardener-Moore, M.D. Edith G. Grannum, M.D.	City Practice Family Practice Non-Participant Est Cohort: 24
David M. Tinkelman, M.D. 6 Sweden Lane Brockport, NY 14420 (716) 637-0060	David M. Tinkelman, M.D.	Suburban Practice Pediatrics Participant Printed Pt List Est Cohort: 118

Practice	Provider(s)	Details
Twelve Corners Pediatrics 1815 South Clinton Ave #310 Rochester, NY 14618 (716) 473-3535	Barbara B. Frelinger, M.D. Allen J. Mardorf, M.D. Sanford J. Mayer, M.D. Mary Beth Robinson, M.D.	Suburban Practice Pediatrics Participant Electronic Pt List Est Cohort: 213
Twig Family Health Center 1425 Portland Ave Rochester, NY 14621 (716) 338-4882	Cynthia Christy, M.D. Lynn Garfunkel, M.D. Joseph D. Graney, M.D. Carol Kavanagh, M.D. Paul F. Lehoullier, M.D. Frank B. Magill, M.D. Brett W. Robbins, M.D. Steven M. Scofield, M.D. Patrice Thibodeau, M.D.	City Practice Hospital Clinic Participant Electronic Pt List Est Cohort: 115
Eugene L. Ver, M.D. 4099 Lake Road Brockport, NY 14420 (716) 637-9220	Eugene L. Ver, M.D.	Suburban Practice Family Practice Non-Participant Est Cohort: 11
Webster Family Practice 630 Bay Road Webster, NY 14580 (716) 671-1110	Stephen S. Robb, M.D.	Suburban Practice Family Practice Non-Participant Est Cohort: 43
Webster Medical Group 60 Barrett Drive #200 Webster, NY 14580 (716) 872-0650	Barton William Kaplan, M.D. Nicolas Venci, M.D. Tinnyam K. Viswanathan, M.D.	Suburban Practice Family Practice Participant Electronic Pt List Est Cohort: 130
West Main Pediatrics 819 West Main Street Rochester, NY 14611 (716) 235-0360	Douglas Liano, M.D. Wendy White-Ryan, M.D.	City Practice Pediatrics Participant Electronic Pt List Est Cohort: 149
West Ridge Family Medicine 2300 Ridge Road West Rochester, NY 14626 (716) 723-3330	Paul C. Costello, M.D. Cornelia F. Lenherr, M.D. Marcia M. Lu, M.D. Paul A. Rapoza, M.D.	Suburban Practice Family Practice Non-Participant Est Cohort: 25

Practice	Provider(s)	Details
Westside Health Services - Brown Sq 175 Lyell Avenue Rochester, NY 14608 (716) 254-6480	Walter S. Beecher, M.D. Mark A. Brown, M.D. Laurie J. Donahue, M.D. Thomas J. McElligott, M.D. Carolyn L. Mok, M.D. Jane Zendarski, M.D. Heidi R. Zinkand, M.D.	City Practice NHC Participant Electronic Pt List Est Cohort: 148
Westside Health Services - Woodward 480 Genesee Street Rochester, NY 14611 (716) 436-3040	Walter S. Beecher, M.D. Louise B. Bennett, M.D. Mark A. Brown, M.D. Kevin A. Fiscella, M.D. Stephen H. Schultz, M.D.	City Practice NHC Participant Electronic Pt List Est Cohort: 79
Westside Pediatric Group 497 Beahan Road Rochester, NY 14624 (716) 247-3270	Margaret E. Colpoys, M.D. Clarene J. Cress, M.D. Carol A. Gagnon, M.D. Michael D. Green, M.D. Mark A. Klier, M.D. Alejandro Marchini, M.D. Piush Sharma, M.D.	Suburban Practice Pediatrics Participant Printed Pt List Est Cohort: 394

Monroe County DOH Letter



Department of Health

John D. Doyle
County Executive

Andrew S. Doniger, M.D., M.P.H.
Director

June 10, 1999

Neil E. Herendeen, M.D.
Pediatric Practice at Children's Hospital
601 Elmwood Avenue, Box 632
Rochester, NY 14642

Dear Dr. Herendeen:

I am writing to ask for your help in measuring the levels of immunization and preventive care in Monroe County. Monroe County shares the national "Healthy People Year 2000" goals to: fully vaccinate at least 90% of all children by their second birthday; ensure that children and adolescents receive recommended primary care; and ensure that they have health insurance. Monroe county has established our own Health Action priorities in the hope of meeting or exceeding these goals.

The Primary Care Immunization Survey, conducted in 1993 and 1996, has become an essential tool to measure progress toward Health Action and Healthy People 2000 goals, and provides important information for the Monroe County Child Health Report Card. Your practice probably participated in the 1993 and 1996 surveys. Since the 1996 survey, many changes have occurred including changes in schedules for recommended immunizations for children and adolescents, and creation of health insurance programs for low-income children.

In order to continue to measure our county's progress, we are conducting another community-wide survey. This time, we will again measure the immunization status of two-year-olds, and will expand this year's survey to include basic measures of primary care and insurance status. With additional funding from the Centers for Disease Control, we will also expand this year's survey to perform the nation's first community-wide assessment of immunization status and primary care for adolescents ages 11-14. We have contracted with the University of Rochester, Rochester Child Health Studies Group, lead by Peter Szilagyi, M.D., M.P.H., to conduct the survey. The enclosed letter and protocol from the University of Rochester describe the survey methodology.

In general, this survey will be similar to the 1993 and 1996 surveys, and will involve medical chart reviews at primary care offices throughout Monroe County. It will be very similar to the prior surveys you have participated in. The chart reviews will take approximately half a day at most practices, and a little longer at large offices. Review times can be scheduled at your convenience, to prevent disruption of your daily office routines. The Health Department will not publish individual practice results. Rather, we are attempting to measure Monroe County's immunization, primary care, and insurance coverage rates. We expect the chart reviews to occur during June – August, 1999. The enclosed letter from the University of Rochester team outlines procedures to ensure patient and provider confidentiality.

We hope for your cooperation and understanding in this important task. Together, let's see how well our county is doing with respect to immunizations and childhood preventive care!

Sincerely,

Andrew S. Doniger, M.D., M.P.H.

Enclosures

111 Westfall Road • Caller 632 • Rochester, New York 14692
printed on recycled paper

Protocol

THE MONROE COUNTY PRIMARY CARE SURVEY Research Protocol

Research Team:

Peter G. Szilagyi, M.D., M.P.H. Richard D. Barth, Lead Analyst/Programmer
Stanley Schaffer, M.D., M.P.H. Sampada Deshpande, Information Analyst / Chart Abstractor
Laura Pollard Shone, M.S.W Jennifer Neill, Research Assistant / Chart Abstractor

Goals:

To measure immunization rates, primary care, and insurance status for 2 year old, 11-12 year old, and 13-14 year old children receiving care in Monroe County primary care practices.

To function as the national pilot site to assess adolescent vaccination and well child care rates systematically and inexpensively.

Subjects:

To be included, children must be born within the appropriate timeframe (Toddlers: 6/1/96 – 5/31/97, Adolescents: 6/1/83 – 5/31/86), and be receiving care at a primary care practice in Monroe County.

Design:

Cross-sectional survey throughout Monroe County.

Measures:

Immunization dates, visit dates, current addresses, race, insurance status and current provider will be recorded.

Up-To-Date rates will be determined using the American Academy of Pediatrics (AAP) schedule for immunizations and for WCC visits.

- 4 DTP, 3 Polio, 4 Hib, 1 MMR and 3 Hep-B (for 2 year old children)
- Hep-B, Td, MMR and Polio as needed (for 11-14 year old children)

Research Process:

1. From each practice, obtain a "denominator" file of eligible children, born during the timeframes specified above, through the practice billing computer or other means. Data elements should include: Last and First names, DOB, gender, race, insurance at most recent visit, address and zip code.
2. Select a random sample of patients from each age group and schedule convenient times for chart review at each practice.
3. Perform chart abstraction and enter data into study database.
4. Identify children seen at multiple sites. Verify the accuracy of the visit histories and combine their data. The most recent site of care will be considered to be the current "primary care site".
5. Use the CDC's CASA (Clinic Assessment Software Application) software to determine immunization rates, and provide practice-specific data to practices that request it.
6. Prepare and submit final report to the Monroe County Health Department.

Consent and Confidentiality:

This study has been approved by the Research Subjects Review Board of the University of Rochester School of Medicine and Dentistry, in accordance with Federal and local laws.

- Results will be reported in aggregate form. No individual patient, physician or practice data will be identified.
- All records will be assigned a unique ID number, which will be used for data processing and management. Records will be stored in secured areas.
- At the practice's request, we will provide the practice with the results of the study (in aggregate form), and with individual level data on that practice's own patients.

University of Rochester Letter and Return Postcard



SCHOOL OF MEDICINE AND DENTISTRY
SCHOOL OF NURSING
STRONG MEMORIAL HOSPITAL
DIVISION OF GENERAL PEDIATRICS

June 10, 1999

Neil E. Herendeen, M.D.
Pediatric Practice at Children's Hospital
601 Elmwood Avenue, Box 632
Rochester, NY 14642

Dear Neil:

We are contacting one physician from each practice in Monroe County to ask for your practice's help. By this time, these letters may begin to look familiar to you, as your practice probably participated in the 1993 and 1996 Primary Care Immunization Surveys. Our group at the University of Rochester is continuing its work in immunization research. Since the last time we contacted you in 1996, we have completed the 1996 Monroe County Immunization Survey, and we have established a Primary Care Outreach Program that provides outreach for patients seen in inner-city practices.

Once again, we have been contracted by Monroe County to perform the 1999 county-wide primary care survey. The survey will assess the current immunization status of two-year olds in Monroe County, as it has in 1993 and 1996. Results of prior surveys have become one of the core elements of the county's Child Health Report Card, and for that reason we hope to expand the scope of the 1999 survey to include elements of primary care and insurance status. We have also received funding from the Centers for Disease Control to include assessment of immunization status and primary care for 11-14 year old adolescents in a similar manner. We will be the first community in the nation to take a county-wide process that works well for young children and apply it to adolescents.

This expansion will not dramatically increase the amount of time or effort required from your practice.

The purpose of this letter is to ask for your collaboration in the latest countywide survey, and to explain the survey methodology. If your practice has participated in the 1993 or 1996 surveys, this will all sound familiar, as the methodology is essentially the same. The enclosed protocol explains the specific sampling and review methods and confidentiality procedures. We will sample a small number of children from each practice and perform chart reviews. We will then pool the data across practices to measure the rates of immunizations and preventive care on a countywide basis.

The results of the county-wide survey will present aggregate data only, and will not identify individual patients. At your request, however, we will provide your practice with a confidential report about your own practice results.

We have enclosed a postcard for your convenience in responding to this letter. We would like to contact you or another individual designated by you, at a time that is convenient for your practice. Please use the enclosed postcard to identify the appropriate contact person, telephone number, and most convenient time to call.

Laura Pollard Shone, M.S.W. is the project manager for the University of Rochester, and Sampada Deshpande or Jennifer Neill will review records at your office. In order to perform the practice survey, we ask you for two things:

- (1) A computer file or list of patients from your practice born between 6/1/96 – 5/31/97 (preschool group), and 6/1/83 – 5/31/86 (adolescent group), from which we will randomly select a small number of patients (about 15-30) in each age group.

A file on diskette is best, and our programmer, Richard Barth, can assist in producing this file if you wish. A paper list will work, too. The list should include patient names, birthdates, insurance coverage at the last visit, and whatever identifier you use to file medical records in your practice (family id or last name, for example, for practices that file by family).

- (2) Access to your medical charts, at a time convenient to your practice, to review charts for the small sample of selected patients.

601 Elmwood Avenue, Box 632
Rochester, New York 14642
(716) 275-5798

Sampada Deshpande or Jennifer Neill will contact your office to speak with your designated contact person. Based on our past experience, we are confident that we can complete most of our work at your practice in just a few hours. We will work within your practice guidelines and schedule to complete our work at your convenience. Thank you in advance for your collaboration – we look forward to working with you again on this important project!

Sincerely,

Peter G. Szilagyi, M.D., M.P.H.
Stanley Schaffer, M.D., M.P.H.
Laura Pollard Shone, M.S.W.
Richard Barth, Analyst/Programmer
Sampada Deshpande, Research Assistant
Jennifer Neill, Research Assistant

Enclosures

Please Print

The Rochester Child Health Studies Group would appreciate your response by June 17, 1999. Thank you.

Contact Name: _____

Best day and time to be reached: _____

Telephone Number: _____

We can develop a list of all children born between 6/1/96 - 5/31/97 and 6/1/83 - 5/31/86:

_____ Manually _____ Using Our Computer

There will be approximately _____ children.

The list will be ready by (date): _____ .

Please Print

Chart Abstraction Form

ABS: _____ / _____ / _____

VER: _____ / _____ / _____

DE: _____ / _____ / _____

Monroe County Preventive Care Survey - Pediatric Practice at Children's Hospital Adolescent Group #1 - Visit Date Range: 08/28/1996 - 08/28/1998							Case ID 100000042246			
							MRN 			
Patient		Sex		DOB		Race		Moved To: _____ Date: _____ From: _____ Date: _____ Last Visit: _____ Date: _____	Exemptions <input type="checkbox"/> This Patient Died .. Date: _____ <input type="checkbox"/> Not A Pt <input type="checkbox"/> No Chart	
Address						HH ID				
Notes						Ins				
Collect VISIT information from the date range listed above, then collect all SHOT data from Birth through the end of the date range listed above.										
Date		Shots	<input type="checkbox"/> ComVax <input type="checkbox"/> OPV/IPV (Polio) <input type="checkbox"/> DTP/DTaP/Dt <input type="checkbox"/> Td (Tetanus) <input type="checkbox"/> Hepatitis-B <input type="checkbox"/> Tetra-Immune <input type="checkbox"/> Hib/H-Flu <input type="checkbox"/> Varicella (Varivax) <input type="checkbox"/> MMR	Ht:	For Adolescents ONLY					
Source		Anemia Testing		Wt:	Counseling/Discussion					
<input type="checkbox"/> WCC at PCP <input type="checkbox"/> Other at PCP <input type="checkbox"/> Shot Listing/Rpt <input type="checkbox"/> Other/Unknow		<input type="checkbox"/> HCT (Hematocrit) Result: _____ <input type="checkbox"/> HGb/Hb (Hemoglobin) _____ <input type="checkbox"/> CBC w/HCT _____		BP:	<input type="checkbox"/> Alcohol/Drugs <input type="checkbox"/> STD's <input type="checkbox"/> Gun Safety <input type="checkbox"/> Tobacco <input type="checkbox"/> HIV/Aids <input type="checkbox"/> Violence <input type="checkbox"/> Puberty/Menstrual Cycle <input type="checkbox"/> School Performance <input type="checkbox"/> Sexuality/Contraception					Health Predictors
					Alcohol / Drug Use <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk Tobacco Product Use <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk Carries Weapons <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk					
Date		Shots	<input type="checkbox"/> ComVax <input type="checkbox"/> OPV/IPV (Polio) <input type="checkbox"/> DTP/DTaP/Dt <input type="checkbox"/> Td (Tetanus) <input type="checkbox"/> Hepatitis-B <input type="checkbox"/> Tetra-Immune <input type="checkbox"/> Hib/H-Flu <input type="checkbox"/> Varicella (Varivax) <input type="checkbox"/> MMR	Ht:	For Adolescents ONLY					
Source		Anemia Testing		Wt:	Counseling/Discussion					
<input type="checkbox"/> WCC at PCP <input type="checkbox"/> Other at PCP <input type="checkbox"/> Shot Listing/Rpt <input type="checkbox"/> Other/Unknow		<input type="checkbox"/> HCT (Hematocrit) Result: _____ <input type="checkbox"/> HGb/Hb (Hemoglobin) _____ <input type="checkbox"/> CBC w/HCT _____		BP:	<input type="checkbox"/> Alcohol/Drugs <input type="checkbox"/> STD's <input type="checkbox"/> Gun Safety <input type="checkbox"/> Tobacco <input type="checkbox"/> HIV/Aids <input type="checkbox"/> Violence <input type="checkbox"/> Puberty/Menstrual Cycle <input type="checkbox"/> School Performance <input type="checkbox"/> Sexuality/Contraception					Health Predictors
					Alcohol / Drug Use <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk Tobacco Product Use <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk Carries Weapons <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk					
Date		Shots	<input type="checkbox"/> ComVax <input type="checkbox"/> OPV/IPV (Polio) <input type="checkbox"/> DTP/DTaP/Dt <input type="checkbox"/> Td (Tetanus) <input type="checkbox"/> Hepatitis-B <input type="checkbox"/> Tetra-Immune <input type="checkbox"/> Hib/H-Flu <input type="checkbox"/> Varicella (Varivax) <input type="checkbox"/> MMR	Ht:	For Adolescents ONLY					
Source		Anemia Testing		Wt:	Counseling/Discussion					
<input type="checkbox"/> WCC at PCP <input type="checkbox"/> Other at PCP <input type="checkbox"/> Shot Listing/Rpt <input type="checkbox"/> Other/Unknow		<input type="checkbox"/> HCT (Hematocrit) Result: _____ <input type="checkbox"/> HGb/Hb (Hemoglobin) _____ <input type="checkbox"/> CBC w/HCT _____		BP:	<input type="checkbox"/> Alcohol/Drugs <input type="checkbox"/> STD's <input type="checkbox"/> Gun Safety <input type="checkbox"/> Tobacco <input type="checkbox"/> HIV/Aids <input type="checkbox"/> Violence <input type="checkbox"/> Puberty/Menstrual Cycle <input type="checkbox"/> School Performance <input type="checkbox"/> Sexuality/Contraception					Health Predictors
					Alcohol / Drug Use <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk Tobacco Product Use <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk Carries Weapons <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk					

Monroe County & Rochester Quadrants by Census Tract

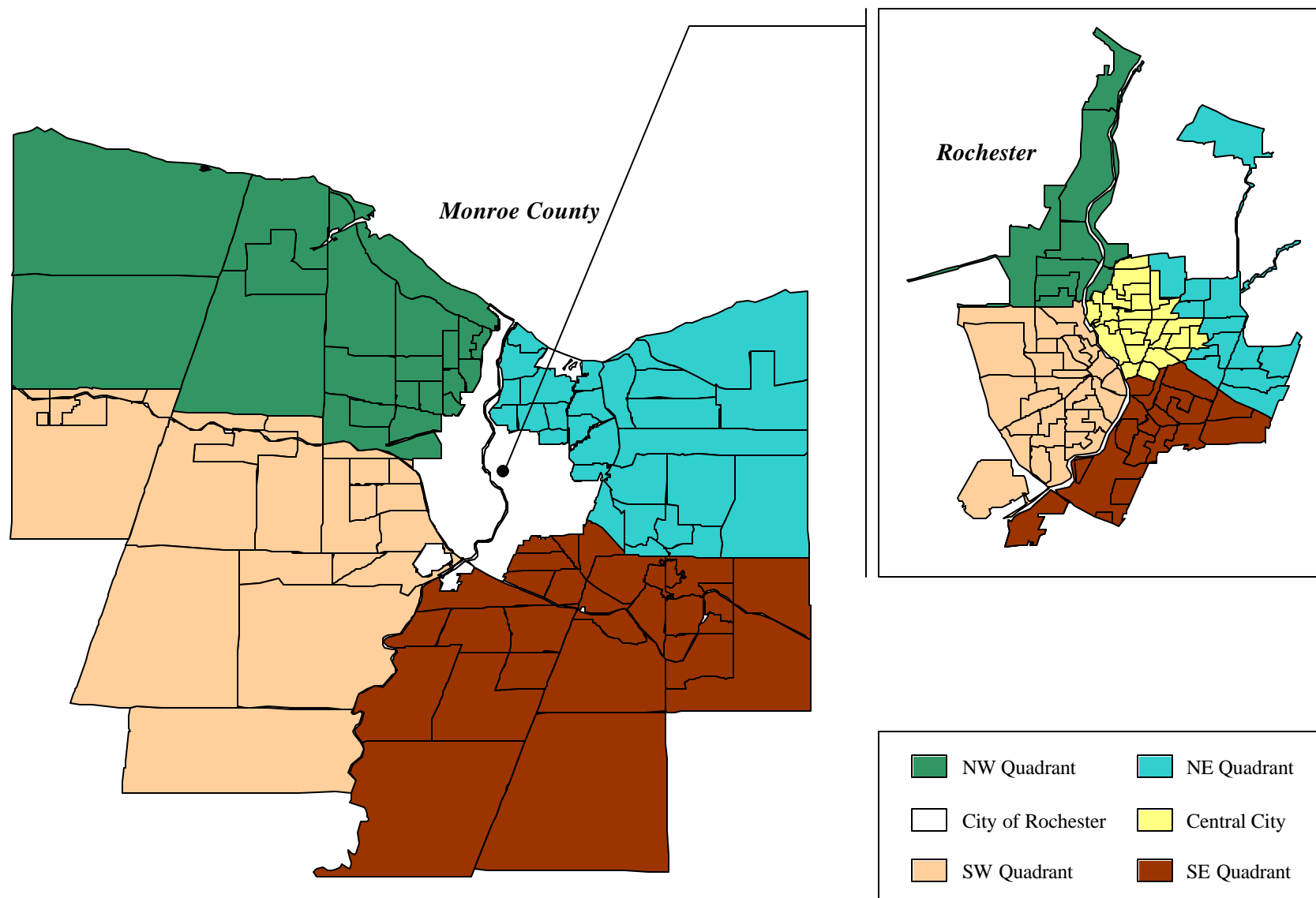


Table 16
Mapping of Census Tracts to Geographic Areas of County

Tract	City vs Suburbs	Quadrant	Tract	City vs Suburbs	Quadrant	Tract	City vs Suburbs	Quadrant	Tract	City vs Suburbs	Quadrant
000200	Inner City	SW	005700	Inner City	NE	010200	Suburbs	NE	013101	Suburbs	SE
000700	Inner City	CC	005800	Rest of City	NE	010300	Suburbs	NE	013103	Suburbs	SE
001000	Inner City	SE	005900	Inner City	NE	010400	Suburbs	NE	013104	Suburbs	SE
001300	Inner City	CC	006000	Rest of City	NE	010500	Suburbs	NE	013202	Suburbs	SE
001400	Inner City	CC	006100	Rest of City	NE	010601	Suburbs	NE	013203	Suburbs	SE
001500	Inner City	CC	006200	Rest of City	SW	010602	Suburbs	NE	013204	Suburbs	SE
001600	Inner City	SW	006300	Inner City	SW	010700	Suburbs	NE	013300	Suburbs	SE
001700	Inner City	SW	006400	Inner City	SW	010800	Suburbs	NE	013400	Suburbs	NW
001800	Rest of City	NW	006500	Inner City	SW	010901	Suburbs	NE	013501	Suburbs	NW
001900	Rest of City	NW	006600	Inner City	SW	010902	Suburbs	NE	013502	Suburbs	NW
002000	Rest of City	NW	006700	Rest of City	SW	011000	Suburbs	NE	013601	Suburbs	NW
002100	Rest of City	NW	006800	Rest of City	SW	011100	Suburbs	NE	013602	Suburbs	NW
002200	Rest of City	NW	006900	Inner City	SW	011201	Suburbs	NE	013701	Suburbs	NW
002300	Inner City	SW	007000	Rest of City	SW	011203	Suburbs	NE	013702	Suburbs	NW
002400	Inner City	SW	007100	Rest of City	SW	011205	Suburbs	NE	013800	Suburbs	NW
002700	Inner City	SW	007500	Rest of City	SW	011206	Suburbs	NE	013901	Suburbs	NW
002900	Inner City	SE	007600	Rest of City	NE	011300	Suburbs	NE	013902	Suburbs	NW
003000	Inner City	SE	007700	Rest of City	NE	011400	Suburbs	NE	014001	Suburbs	NW
003100	Inner City	SE	007801	Rest of City	SE	011501	Suburbs	NE	014003	Suburbs	NW
003200	Inner City	SE	007802	Rest of City	SE	011503	Suburbs	NE	014004	Suburbs	NW
003300	Rest of City	SE	007900	Inner City	CC	011504	Suburbs	NE	014102	Suburbs	NW
003400	Rest of City	SE	008000	Inner City	CC	011505	Suburbs	NE	014103	Suburbs	NW
003500	Rest of City	SE	008100	Rest of City	NE	011601	Suburbs	NE	014104	Suburbs	NW
003600	Rest of City	SE	008200	Rest of City	NE	011603	Suburbs	NE	014202	Suburbs	SW
003700	Rest of City	SE	008300	Rest of City	NE	011604	Suburbs	NE	014203	Suburbs	SW
003801	Rest of City	SE	008400	Inner City	NE	011605	Suburbs	NE	014204	Suburbs	SW
003802	Rest of City	SE	008500	Rest of City	NW	011701	Suburbs	SE	014301	Suburbs	SW
003803	Rest of City	SE	008600	Rest of City	NW	011703	Suburbs	SE	014302	Suburbs	SW
003804	Rest of City	SE	008701	Rest of City	SW	011704	Suburbs	SE	014400	Suburbs	SW
003900	Inner City	CC	008702	Rest of City	SW	011800	Suburbs	SE	014502	Suburbs	SW
004000	Inner City	SW	008800	Rest of City	SW	011901	Suburbs	SE	014503	Suburbs	SW
004100	Inner City	SW	008900	Rest of City	SW	011902	Suburbs	SE	014504	Suburbs	SW
004300	Inner City	CC	009000	Inner City	CC	012000	Suburbs	SE	014600	Suburbs	SW
004601	Rest of City	NW	009100	Inner City	CC	012100	Suburbs	SE	014700	Suburbs	SW
004602	Inner City	CC	009200	Inner City	CC	012201	Suburbs	SE	014802	Suburbs	NW
004701	Rest of City	CC	009301	Inner City	CC	012202	Suburbs	SE	014803	Suburbs	NW
004702	Inner City	CC	009302	Inner City	SC	012301	Suburbs	SE	014804	Suburbs	NW
004800	Inner City	CC	009401	Inner City	CC	012302	Suburbs	SE	014901	Suburbs	SW
004900	Inner City	CC	009402	Inner City	SE	012400	Suburbs	SE	014903	Suburbs	SW
005000	Inner City	CC	009403	Inner City	SW	012500	Suburbs	NE	014904	Suburbs	SW
005100	Inner City	CC	009500	Inner City	SW	012600	Suburbs	SE	015000	Suburbs	SW
005200	Inner City	CC	009601	Inner City	SW	012700	Suburbs	SE	015100	Suburbs	NW
005300	Inner City	CC	009602	Inner City	SW	012800	Suburbs	SE	015200	Suburbs	NW
005400	Rest of City	NE	009603	Inner City	SW	012900	Suburbs	SE	015301	Suburbs	SW
005500	Inner City	CC	009604	Inner City	SW	013001	Suburbs	SE	015302	Suburbs	SW
005600	Inner City	CC	010100	Suburbs	NE	013002	Suburbs	SE	015400	Suburbs	SW

Table 17
Demographic Characteristics of Patients
By Area of the County

		Children in the Inner City N @ 2,247		Children in the Rest of the City N @ 1,548		Children Living in the Suburbs N @ 6,271		All Children Living in the County N @ 10,066		Children from Outside the County N @ 1,326		All Children Seen in the County N @ 11,392	
		N	%	N	%	N	%	N	%	N	%	N	%
Gemder	Female	1,152	51.3	727	47.0	2,909	46.4	4,788	47.6	704	53.1	5,492	48.2
	Male	1,095	48.7	821	53.0	3,361	53.6	5,277	52.4	622	46.9	5,900	51.8
Race / Ethnicity	Asian/Pacific Islander	37	1.6	29	1.9	202	3.2	253	2.5	7	0.5	266	2.3
	Black – Non-Hispanic	1,300	57.9	578	37.3	442	7.1	2,779	27.6	25	1.9	2,851	25.0
	Hispanic	470	20.9	230	14.9	177	2.8	1,044	10.4	25	1.9	1,086	9.5
	Other	103	4.6	121	7.8	162	2.6	414	4.1	38	2.9	454	4.0
	White – Non-Hispanic	337	15.0	590	38.1	5,286	84.3	5,575	55.4	1,230	92.8	6,734	59.1
Time of Last Visit	Within Past Yr	2,172	96.6	1,517	98.0	6,126	97.7	9,815	97.5	1,322	99.7	11,136	97.8
	More Than 1 Yr Ago	58	2.6	22	1.4	135	2.2	215	2.1	4	0.3	219	1.9
	No Record of Visits	18	0.8	9	0.6	9	0.1	36	0.4	0	0.0	36	0.3
Type of Primary Health Care Provider	Family Medicine	200	8.9	140	9.0	559	8.9	898	8.9	269	20.3	1,167	10.2
	Hospital Clinic	985	43.8	606	39.1	385	6.1	1,976	19.6	79	6.0	2,054	18.0
	Neighborhood HC	397	17.7	143	9.2	46	0.7	586	5.8	5	0.4	592	5.2
	Pediatric Practice	549	24.4	582	37.6	5,005	79.8	6,136	61.0	965	72.7	7,100	62.3
	Staff Model HMO	116	5.2	77	5.0	276	4.4	470	4.7	9	0.7	478	4.2
Number of Sites of Care	One	1,693	75.3	1,285	83.1	5,612	89.5	8,590	85.3	1,107	83.5	9,697	85.1
	Multiple	554	24.7	262	16.9	659	10.5	1,476	14.7	219	16.5	1,694	14.9
Insurance	MC – Private (Fully Insured)¹	490	21.8	769	49.7	5,033	80.3	6,319	62.8	1,072	80.8	7,395	64.9
	FFS – Private (Underinsured)²	50	2.2	27	1.7	376	6.0	455	4.5	112	8.4	568	5.0
	MC – Medicaid¹	721	32.1	310	20.0	231	3.7	1,250	12.4	28	2.1	1,274	11.2
	FFS – Medicaid²	714	31.8	275	17.8	229	3.7	1,206	12.0	46	3.5	1,249	11.0
	Child Health Plus	82	3.6	42	2.7	198	3.2	321	3.2	24	1.8	346	3.0
	Uninsured	191	8.5	115	7.4	188	3.0	492	4.9	44	3.3	535	4.7
	Other	0	0.0	9	0.6	14	0.2	23	0.2	0	0.0	23	0.2

¹ MC = Managed Care² FFS = Fee-For-Service

Table 18
Demographic Characteristics of Patients
By Quadrant of the City

		Children Living in the Northwestern City N @ 501		Children Living in the Northeastern City N @ 679		Children Living in the Central City N @ 1,042		Children Living in the Southwestern City N @ 1,193		Children Living in the Southeastern City N @ 381		All Children in the City of Rochester N @ 3,795	
		N	%	N	%	N	%	N	%	N	%	N	%
Gemder	Female	242	48.3	335	49.3	500	48.0	605	50.7	197	51.7	1,879	49.5
	Male	259	51.7	344	50.7	541	52.0	589	49.3	184	48.3	1,916	50.5
Race / Ethnicity	Asian/Pacific Islander	0	0.0	6	0.9	0	0.0	27	2.3	38	9.9	66	1.7
	Black – Non-Hispanic	103	20.6	311	45.9	608	58.4	694	58.2	161	42.1	1,905	50.2
	Hispanic	120	24.0	123	18.1	280	26.9	153	12.8	23	6.0	710	18.7
	Other	64	12.8	21	3.1	59	5.7	64	5.4	12	3.1	220	5.8
	White – Non-Hispanic	214	42.7	217	32.0	94	9.0	255	21.4	148	38.7	895	23.6
Time of Last Visit	Within Past Yr	496	99.0	661	97.3	1,009	96.8	1,150	96.4	372	97.6	3,689	97.2
	More Than 1 Yr Ago	0	0.0	4	0.6	33	3.2	34	2.8	9	2.4	79	2.1
	No Record of Visits	5	1.0	14	2.1	0	0.0	9	0.8	0	0.0	27	0.7
Type of Primary Health Care Provider	Family Medicine	55	11.0	22	3.2	73	7.0	153	12.8	36	9.5	340	9.0
	Hospital Clinic	183	36.6	238	35.1	482	46.3	547	45.9	140	36.8	1,590	41.9
	Neighborhood HC	45	9.0	66	9.7	201	19.3	188	15.8	41	10.8	540	14.2
	Pediatric Practice	200	40.0	308	45.4	234	22.5	229	19.2	159	41.8	1,131	29.8
	Staff Model HMO	17	3.4	45	6.6	52	5.0	76	6.4	4	1.1	194	5.1
Number of Sites of Care	One	438	87.4	503	74.1	799	76.7	954	80.0	285	74.8	2,978	78.5
	Multiple	63	12.6	176	25.9	243	23.3	239	20.0	96	25.2	817	21.5
Insurance	MC – Private (Fully Insured)¹	272	54.4	263	38.7	128	12.3	392	32.8	206	54.1	1,257	33.1
	FFS – Private (Underinsured)²	9	1.8	0	0.0	43	4.1	15	1.3	9	2.4	77	2.0
	MC – Medicaid¹	106	21.2	159	23.4	313	30.1	402	33.7	52	13.6	1,033	27.2
	FFS – Medicaid²	73	14.6	113	16.6	404	38.8	317	26.5	82	21.5	990	26.1
	Child Health Plus	13	2.6	20	2.9	64	6.1	10	0.8	17	4.5	123	3.2
	Uninsured	27	5.4	120	17.7	89	8.5	58	4.9	10	2.6	306	8.1
	Other	0	0.0	4	0.6	0	0.0	0	0.0	5	1.3	9	0.2

¹ MC = Managed Care² FFS = Fee-For-Service

Table 19
Demographic Characteristics of Patients
By Quadrant of the County

		Children Living in the Northwestern Suburbs N @ 1,177		Children Living in the Northeastern Suburbs N @ 1,900		Children Living in Rochester N @ 3,795		Children Living in the Southwestern Suburbs N @ 1,287		Children Living in the Southeastern Suburbs N @ 1,908		All Children Living in the County N @ 10,066	
		N	%	N	%	N	%	N	%	N	%	N	%
Gemder	Female	516	43.8	810	42.6	1,879	49.5	657	51.1	926	48.6	4,788	47.6
	Male	661	56.2	1,090	57.4	1,916	50.5	629	48.9	981	51.4	5,277	52.4
Race / Ethnicity	Asian/Pacific Islander	64	5.4	24	1.3	66	1.7	16	1.2	104	5.5	253	2.5
	Black – Non-Hispanic	57	4.9	149	7.8	1,905	50.2	103	8.0	143	7.5	2,779	27.6
	Hispanic	37	3.1	33	1.7	710	18.7	33	2.6	81	4.2	1,044	10.4
	Other	28	2.4	41	2.2	220	5.8	38	3.0	57	3.0	414	4.1
	White – Non-Hispanic	989	84.2	1,653	87.0	895	23.6	1,097	85.2	1,523	79.8	5,575	55.4
Time of Last Visit	Within Past Yr	1,139	96.9	1,838	96.7	3,689	97.2	1,257	97.6	1,892	99.2	9,815	97.5
	More Than 1 Yr Ago	37	3.1	57	3.0	79	2.1	26	2.0	16	0.8	215	2.1
	No Record of Visits	0	0.0	5	0.3	27	0.7	5	0.4	0	0.0	36	0.4
Type of Primary Health Care Provider	Family Medicine	108	9.2	135	7.1	340	9.0	228	17.7	87	4.6	898	8.9
	Hospital Clinic	95	8.1	155	8.2	1,590	41.9	48	3.7	87	4.6	1,976	19.6
	Neighborhood HC	15	1.3	15	0.8	540	14.2	10	0.8	5	0.3	586	5.8
	Pediatric Practice	915	77.7	1,522	80.1	1,131	29.8	937	72.8	1,632	85.6	6,136	61.0
	Staff Model HMO	44	3.7	72	3.8	194	5.1	64	5.0	96	5.0	470	4.7
Number of Sites of Care	One	1,020	86.7	1,643	86.5	2,978	78.5	1,131	87.9	1,817	95.2	8,590	85.3
	Multiple	156	13.3	256	13.5	817	21.5	155	12.1	91	4.8	1,476	14.7
Insurance	MC – Private (Fully Insured)¹	896	76.2	1,556	81.9	1,257	33.1	1,069	83.1	1,514	79.4	6,319	62.8
	FFS – Private (Underinsured)²	59	5.0	70	3.7	77	2.0	79	6.1	168	8.8	455	4.5
	MC – Medicaid¹	35	3.0	106	5.6	1,033	27.2	29	2.3	60	3.1	1,250	12.4
	FFS – Medicaid²	81	6.9	75	3.9	990	26.1	25	1.9	47	2.5	1,206	12.0
	Child Health Plus	36	3.1	35	1.8	123	3.2	68	5.3	59	3.1	321	3.2
	Uninsured	69	5.9	43	2.3	306	8.1	17	1.3	60	3.1	492	4.9
	Other	0	0.0	14	0.7	9	0.2	0	0.0	0	0.0	23	0.2

¹ MC = Managed Care² FFS = Fee-For-Service

Table 20
Up-to-Date Rates (1999)
By Quadrant of the City

		Children in the Northwestern City		Children in the Northeastern City		Children in the Central City		Children in the Southwestern City		Children in the Southeastern City		All Children in the City of Rochester	
		N @ 501		N @ 679		N @ 1,042		N @ 1,193		N @ 381		N @ 3,795	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
At 12 Months of Age	DIP ₃	96.3	90.3 98.6	96.9	90.8 99.0	95.2	91.6 97.3	87.4	83.3 90.7	94.2	85.0 97.9	93.1	91.1 94.7
	Polio ₂	98.1	93.2 99.5	99.3	96.0 99.9	98.9	94.7 99.8	95.3	91.5 97.4	96.3	88.6 98.9	97.5	96.1 98.4
	Hib ₃	91.7	84.4 95.8	92.1	86.4 95.6	90.8	82.7 95.3	81.9	75.2 87.0	87.2	75.9 93.7	88.0	82.8 91.8
	HepB ₂	98.9	92.1 99.9	97.7	89.8 99.5	99.6	96.4 100.0	97.4	95.2 98.6	96.8	88.5 99.1	98.2	96.9 98.9
	DIP ₃ /Polio ₂ /Hib ₃	90.9	84.1 94.9	92.1	86.4 95.6	90.8	82.7 95.3	81.2	74.8 86.3	87.2	75.9 93.7	87.7	82.6 91.4
	DIP ₃ /Polio ₂ /Hib ₃ /HepB ₂ *	90.9	84.1 94.9	90.5	83.2 94.8	90.8	82.7 95.3	81.2	74.8 86.3	87.2	75.9 93.7	87.4	82.3 91.1
At 24 Months of Age	DIP ₄	92.6	85.5 96.4	92.8	86.3 96.4	94.0	91.0 96.0	86.0	81.6 89.4	88.5	69.4 96.3	90.5	87.7 92.8
	Polio ₃	94.9	87.2 98.1	98.7	95.8 99.6	98.5	93.9 99.6	93.0	88.4 95.8	90.7	72.7 97.2	95.5	91.8 97.6
	MMR ₁	97.3	89.3 99.4	97.7	90.8 99.5	96.9	94.2 98.4	91.8	87.1 94.9	97.8	88.0 99.6	95.6	93.3 97.1
	Hib ₃	97.4	92.9 99.1	98.7	95.8 99.6	98.9	95.2 99.8	96.1	93.4 97.7	93.0	85.4 96.8	97.2	95.7 98.2
	Hib ₄	88.2	79.7 93.5	84.4	75.4 90.5	88.6	78.8 94.2	82.3	75.2 87.8	82.4	70.5 90.1	85.2	79.7 89.4
	HepB ₃	97.4	91.2 99.3	96.4	89.6 98.8	97.0	92.7 98.8	94.7	90.5 97.1	91.9	83.7 96.2	95.7	93.8 97.1
	DIP ₄ /Polio ₃ /MMR ₁	90.0	80.4 95.2	92.8	86.3 96.4	92.6	89.7 94.7	83.3	77.1 88.0	86.2	66.4 95.2	88.7	85.1 91.6
	DIP ₄ /Polio ₃ /MMR ₁ /Hib ₃ /HepB ₃	86.6	76.1 92.9	89.9	82.0 94.6	91.8	88.7 94.1	81.4	75.3 86.4	82.8	62.7 93.3	86.6	82.4 89.9
	DIP ₄ /Polio ₃ /MMR ₁ /Hib ₄	82.6	73.1 89.3	82.1	74.3 87.8	84.8	75.8 90.9	77.6	70.9 83.1	79.0	62.6 89.4	81.2	76.2 85.3
	DIP ₄ /Polio ₃ /MMR ₁ /Hib ₄ /HepB ₃	81.8	71.8 88.8	79.8	72.1 85.8	84.4	75.5 90.5	76.5	69.5 82.3	77.9	59.6 89.4	80.1	74.9 84.4
	DIP ₄ /Polio ₃ /MMR ₁ /Hib ^(c 12m)	85.5	75.6 91.9	80.1	61.1 91.2	87.3	81.8 91.3	79.5	72.4 85.2	84.8	65.7 94.2	83.1	79.1 86.5
	DIP ₄ /Polio ₃ /MMR ₁ /Hib ^(c 12m) /HepB ₃ *	84.7	74.0 91.5	77.8	59.8 89.2	87.3	81.8 91.3	78.0	70.9 83.8	82.6	62.0 93.2	81.9	77.7 85.4

* Most stringent current rates

Table 21
Up-to-Date Rates (1999)
By Quadrant of the County

		Children in the Northwestern Suburbs		Children in the Northeastern Suburbs		Children in the City of Rochester		Children in the Southwestern Suburbs		Children in the Southeastern Suburbs		All Children in the Monroe County	
		N @ 1,177		N @ 1,900		N @ 3,795		N @ 1,287		N @ 1,908		N @ 10,066	
		%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
At 12 Months of Age	DIP ₃	97.0	90.9 99.1	96.9	92.4 98.8	93.1	91.1 94.7	98.0	93.5 99.4	94.4	89.2 97.2	95.1	93.4 96.4
	Polio ₂	98.6	93.0 99.7	98.3	94.1 99.5	97.5	96.1 98.4	98.7	93.5 99.7	97.7	94.7 99.0	98.0	96.8 98.7
	Hib ₃	93.4	84.4 97.4	91.2	86.4 94.5	88.0	82.8 91.8	92.3	80.7 97.2	92.5	87.7 95.5	90.6	87.5 93.1
	HepB ₂	98.2	93.0 99.6	98.7	95.1 99.7	98.2	96.9 98.9	97.2	90.7 99.2	95.3	90.1 97.8	97.6	96.0 98.6
	DIP ₃ /Polio ₂ /Hib ₃	93.4	84.4 97.4	91.2	86.4 94.5	87.7	82.7 91.4	92.3	80.7 97.2	92.5	87.7 95.5	90.5	87.4 92.9
	DIP ₃ /Polio ₂ /Hib ₃ /HepB ₂ *	93.0	83.9 97.1	91.0	86.1 94.3	87.4	82.4 91.1	90.5	78.6 96.1	89.9	83.3 94.0	89.6	86.2 92.2
At 24 Months of Age	DIP ₄	92.1	84.9 96.1	94.1	86.1 97.6	90.5	87.7 92.7	97.5	92.1 99.2	95.3	91.1 97.6	93.2	91.0 94.9
	Polio ₃	94.9	90.0 97.5	94.9	87.4 98.0	95.5	91.8 97.6	97.7	87.4 99.6	95.1	87.7 98.1	95.5	93.2 97.1
	MMR ₁	96.0	88.6 98.6	96.7	87.0 99.2	95.6	93.3 97.1	96.6	89.5 98.9	96.8	92.9 98.6	96.2	94.3 97.5
	Hib ₃	97.9	92.0 99.5	94.9	89.6 97.5	97.2	95.7 98.2	99.0	92.8 99.9	97.0	92.9 98.7	97.0	95.7 98.0
	Hib ₄	88.6	73.7 95.5	87.6	78.6 93.1	85.2	79.8 89.4	84.8	68.5 93.5	91.9	86.7 95.1	87.3	83.1 90.5
	HepB ₃	94.8	82.4 98.6	97.4	93.5 99.0	95.7	93.8 97.0	96.6	90.8 98.8	94.5	89.2 97.3	95.8	94.2 96.9
	DIP ₄ /Polio ₃ /MMR ₁	90.4	82.6 95.0	93.4	86.2 96.9	88.7	85.1 91.5	95.1	88.5 98.0	92.3	86.0 95.9	91.3	88.7 93.3
	DIP ₄ /Polio ₃ /MMR ₁ /Hib ₃ /HepB ₃	86.2	74.5 93.1	89.2	80.6 94.2	86.6	82.4 89.9	93.0	86.4 96.5	88.3	81.0 93.0	88.2	85.2 90.6
	DIP ₄ /Polio ₃ /MMR ₁ /Hib ₄	84.1	70.8 92.1	86.1	77.8 91.6	81.2	76.2 85.3	82.9	68.4 91.6	88.4	81.4 92.9	84.0	80.0 87.4
	DIP ₄ /Polio ₃ /MMR ₁ /Hib ₄ /HepB ₃	83.0	69.3 91.3	85.4	77.3 90.9	80.1	75.0 84.4	80.8	66.0 90.1	86.3	78.9 91.5	82.7	78.6 86.2
	DIP ₄ /Polio ₃ /MMR ₁ /Hib ^(≤ 12m)	87.8	76.5 94.0	87.2	79.7 92.2	83.1	79.1 86.4	88.6	77.2 94.7	90.3	83.6 94.5	86.5	82.4 89.7
	DIP ₄ /Polio ₃ /MMR ₁ /Hib ^(≤ 12m) /HepB ₃ *	86.6	75.1 93.3	86.5	79.1 91.6	81.9	77.8 85.4	86.5	75.0 93.2	87.2	79.6 92.3	84.9	80.8 88.3

* Most stringent current rates

Table 22
Up-to-Date Rates (Percent) - For 1993 vs. 1996 vs. 1999
By Area of the County

		Children in the Inner City			Children in the Rest of the City			Children Living in the Suburbs			All Children Living in the County			Children from Outside the County			All Children Seen in the County		
		93 2,788	96 2,540	99 2,247	93 1,724	96 1,776	99 1,548	93 4,984	96 6,292	99 6,271	93 9,496	96 10,616	99 10,066	93 1,048	96 1,376	99 1,326	93 10,544	96 11,984	99 11,392
At 12 Months of Age	DIP ₃	77	86	91.9	87	91	94.8	94	97	96.4	88	92	95.1	93	95	94.4	88	92	95.0
	Polio ₂	92	95	97.6	94	96	97.3	97	99	98.3	95	97	98.0	97	97	99.4	95	97	98.1
	Hib ₃	67	84	87.1	80	90	89.3	88	95	92.2	81	90	90.6	86	94	89.6	81	90	90.5
	HepB ₂	-	90	98.8	-	88	97.3	-	89	97.3	-	89	97.6	-	88	96.6	-	89	97.5
	DIP ₃ /Polio ₂ /Hib ₃	67.0	83.8	86.8	79.4	89.2	89.0	88.0	94.8	92.2	80.3	89.5	90.5	85.1	93.5	89.6	80.7	89.9	90.4
	DIP ₃ /Polio ₂ /Hib ₃ /HepB ₂	-	78.4	86.8	-	81.1	88.3	-	85.8	90.9	-	82.1	89.6	-	85.2	88.9	-	82.4	89.5
At 24 Months of Age	DIP ₄	69	80	89.9	74	85	91.4	83	91	94.8	77	86	93.2	78	88	90.2	77	86	92.8
	Polio ₃	74	89	95.9	78	90	94.9	85	96	95.5	80	92	95.5	82	90	93.8	80	92	95.3
	MMR ₁	84	87	95.4	87	89	95.9	93	95	96.6	89	90	96.2	85	92	95.5	89	91	96.1
	Hib ₄	61	80	86.1	74	84	83.9	82	90	88.5	74	85	87.3	74	90	86.4	74	86	87.2
	HepB ₃	-	87	96.1	-	85	95.2	-	90	95.9	-	88	95.8	-	90	95.4	-	88	95.8
	DIP ₄ /Polio ₃ /MMR ₁	67.0	77.1	88.5	72.4	82.8	89.1	80.3	88.8	92.8	74.9	83.1	91.3	75.2	85.2	90.2	75.0	83.3	91.2
	DIP ₄ /Polio ₃ /MMR ₁ /Hib ₃ /HepB ₃	-	-	86.5	-	-	86.7	-	-	89.1	-	-	88.2	-	-	88.2	-	-	88.0
	DIP ₄ /Polio ₃ /MMR ₁ /Hib ₄	-	74.5	81.7	-	79.5	80.5	-	84.9	85.8	-	79.8	84.0	-	82.6	82.6	-	80.1	83.9
	DIP ₄ /Polio ₃ /MMR ₁ /Hib ₄ /HepB ₃	-	-	80.5	-	-	79.5	-	-	84.3	-	-	82.7	-	-	81.3	-	-	82.6
	DIP ₄ /Polio ₃ /MMR ₁ /Hib ₃ (^{12m})	54.7	75.2	84.2	64.3	81.1	81.4	73.4	85.3	88.5	66.2	80.6	86.5	66.4	83.9	87.5	66.2	80.9	86.6
	DIP ₄ /Polio ₃ /MMR ₁ /Hib ₃ (^{12m})/HepB ₃	-	70.3	83.1	-	73.7	80.1	-	79.8	86.7	-	75.0	84.9	-	78.1	85.4	-	75.3	85.0

Table 23
Up-to-Date Rates (Percent) - For 1996 vs 1999
By Quadrant of the City

		Children in the Northwestern City		Children in the Northeastern City		Children in the Central City		Children in the Southwestern City		Children in the Southeastern City		All Children in the City of Rochester	
		96 420	99 501	96 732	99 679	96 1,152	99 1,042	96 1,516	99 1,193	96 496	99 381	96 4,316	99 3,795
At 12 Months of Age	DIP ₃	94	96.3	90	96.9	85	95.2	87	87.4	90	94.2	88	93.1
	Polio ₂	97	98.1	98	99.3	95	98.9	94	95.3	93	96.3	95	97.5
	Hib ₃	91	91.7	89	92.1	84	90.8	85	81.9	89	87.2	86	88.0
	HepB ₂	91	98.9	91	97.7	90	99.6	89	97.4	83	96.8	90	98.2
	DIP ₃ /Polio ₂ /Hib ₃	91.0	90.9	88.0	92.1	82.8	90.8	84.8	81.2	89.3	87.2	85.6	87.7
	DIP ₃ /Polio ₂ /Hib ₃ /HepB ₂	83.3	90.9	82.9	90.5	78.2	90.8	78.6	81.2	77.4	87.2	79.4	87.4
At 24 Months of Age	DIP ₄	86	92.6	85	92.8	81	94.0	80	86.0	86	88.5	82	90.5
	Polio ₃	88	94.9	91	98.7	90	98.5	87	93.0	94	90.7	89	95.5
	MMR ₁	85	97.3	91	97.7	86	96.9	87	91.8	92	97.8	87	95.6
	Hib ₄	83	88.2	86	84.4	82	88.6	78	82.3	86	82.4	82	85.2
	HepB ₃	88	97.4	88	96.4	88	97.0	86	94.7	81	91.9	87	95.7
	DIP ₄ /Polio ₃ /MMR ₁	82.1	90.0	82.1	92.8	76.0	92.6	78.3	83.3	84.5	86.2	79.0	88.7
	DIP ₄ /Polio ₃ /MMR ₁ /Hib ₃ /HepB ₃	-	86.6	-	89.9	-	91.8	-	81.4	-	82.8	-	86.6
	DIP ₄ /Polio ₃ /MMR ₁ /Hib ₄	78.2	82.6	80.3	82.1	74.4	84.8	74.4	77.6	81.0	79.0	76.2	81.2
	DIP ₄ /Polio ₃ /MMR ₁ /Hib ₄ /HepB ₃	-	81.8	-	79.8	-	84.4	-	76.5	-	77.9	-	80.1
	DIP ₄ /Polio ₃ /MMR ₁ /Hib ^(c 12m)	80.8	85.5	80.3	80.1	75.2	87.3	75.9	79.5	81.0	84.8	77.2	83.1
	DIP ₄ /Polio ₃ /MMR ₁ /Hib ^(c 12m) /HepB ₃	76.9	84.7	73.5	77.8	72.1	87.3	70.2	78.0	66.7	82.6	71.5	81.9

Table 24
Up-to-Date Rates (Percent) - For 1996 vs 1999
By Quadrant of the County

		Children in the Northwestern Suburbs		Children in the Northeastern Suburbs		Children in the City of Rochester		Children in the Southwestern Suburbs		Children in the Southeastern Suburbs		All Children in the Monroe County	
		96 1,368	99 1,177	96 1,568	99 1,900	96 4,316	99 3,795	96 1,332	99 1,287	96 2,024	99 1,908	96 10,608	99 10,066
At 12 Months of Age	DTP ₃	98	97.0	98	96.9	88	93.1	97	98.0	97	94.4	92	95.1
	Polio ₂	99	98.6	98	98.3	95	97.5	99	98.7	98	97.7	97	98.0
	Hib ₃	94	93.4	96	91.2	86	88.0	93	92.3	96	92.5	90	90.6
	HepB ₂	91	98.2	90	98.7	90	98.2	90	97.2	86	95.3	89	97.6
	DTP ₃ /Polio ₂ /Hib ₃	94.2	93.4	95.8	91.2	85.6	87.7	92.2	92.3	96.4	92.5	89.5	90.5
	DTP ₃ /Polio ₂ /Hib ₃ /HepB ₂	86.7	93.0	88.5	91.0	79.4	87.4	83.1	90.5	85.1	89.9	82.1	89.6
At 24 Months of Age	DTP ₄	92	92.1	88	94.1	82	90.5	92	97.5	92	95.3	86	93.2
	Polio ₃	97	94.9	93	94.9	89	95.5	99	97.7	96	95.1	92	95.5
	MMR ₁	95	96.0	92	96.7	87	95.6	99	96.6	94	96.8	90	96.2
	Hib ₄	88	88.6	88	87.6	82	85.2	91	84.8	93	91.9	85	87.3
	HepB ₃	91	94.8	90	97.4	87	95.7	93	96.6	87	94.5	88	95.8
	DTP ₄ /Polio ₃ /MMR ₁	90.0	90.4	84.8	93.4	79.0	88.7	92.2	95.1	88.7	92.3	83.1	91.3
	DTP ₄ /Polio ₃ /MMR ₁ /Hib ₃ /HepB ₃	-	86.2	-	89.2	-	86.6	-	93.0	-	88.3	-	88.2
	DTP ₄ /Polio ₃ /MMR ₁ /Hib ₄	85.0	84.1	80.6	86.1	76.2	81.2	86.4	82.9	87.2	88.4	79.8	84.0
	DTP ₄ /Polio ₃ /MMR ₁ /Hib ₄ /HepB ₃	-	83.0	-	85.4	-	80.1	-	80.8	-	86.3	-	82.7
	DTP ₄ /Polio ₃ /MMR ₁ /Hib _(^c 12m)	84.2	87.8	79.4	87.2	77.2	83.1	89.6	88.6	87.7	90.3	80.6	86.5
	DTP ₄ /Polio ₃ /MMR ₁ /Hib _(^c 12m) /HepB ₃	79.2	86.6	75.8	86.5	71.5	81.9	85.7	86.5	79.0	87.2	75.0	84.9